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Many Innovations Exhibited at Power Show

Science and Invention Make Notable Contribution To Country's Output At National Exposition of Power and Mechanical Engineering—Many Products of Interest To Paper Industry Displayed.

The Fourteenth National Exposition of Power and Mechanical Engineering opened at the Grand Central Palace, New York, on December 2 and will be continued to the 7th. Nearly 300 exhibits are grouped on the three floors of the building. The significance this year of power as a great vital asset in the program of national defense now in progress is well understood and the ability of the nation's manufacturers to amply meet the need, however large it may be, is indicated by the equipment on view at this exposition.

Among the products displayed are many types of combustion apparatus, boilers and heaters, refractories and insulation, piping, valves, etc., steam plant equipment, instruments for recording and controlling, transmission apparatus, electrical equipment, material handling apparatus, standard and special metals and materials, power plant specialties, machines and tools.

The paper and pulp industry will find of particular interest the exhibits of companies which are well known through installation of their products in many paper and pulp mills throughout the country. This equipment and supplies are briefly summarized in the following list of individual companies.

Armstrong Machine Works

The exhibit of the Armstrong Machine Works, featured a glass model of the Armstrong Trap, operating at 5 pounds steam pressure. By means of this model visitors were able to observe how the Armstrong Trap is able to handle air and dirt, as well as condensate. Another item of particular interest to the paper industry was the Armstrong Humidifier, shown in operation and using steam as the humidifying medium. A glass model of the Armstrong Foul Gas Purger, also was on display.

Company representatives in attendance included, O. E. Ulrich, T. H. Rea, Chas. W. Gill, C. Wilson Gill, Jr., Robert Bristol, Fred Croes, Arthur Thomas, and Wm. Hoyt.

Askania Regulator Co.

At the exhibit of the Askania Regulator Co. the featured display was the company's hydraulically-operated automatic combustion control in operation, demonstrating the high sensitivity, great stability, positive operation and low maintenance cost of the system.

Representatives in attendance included, H. J. Velten, W. F. Pray, J. C. Vaaler, C. E. Hague and Harry T. Porter.

Bristol Co.

The exhibit of The Bristol Company featured recent developments in Round-Chart Potentiometers and Resistance Thermometers, without continuously moving parts, requiring no lubrication and resistant to plant vibration. Bristol's Air-Operated Controllers were also displayed and the company's Telemetering Systems, using Bristol's Metameter and Metavane were demonstrated.

Officers and representatives in attendance include: H. E. Beane, field sales manager; C. Webber, New York district manager; R. A. Blodgett, sales engineer; L. B. Lumpkin, sales engineer; G. A. Hall, sales engineer; H. A. Graf, sales engineer; N. J. Cherry, sales engineer; W. M. Messner, sales engineer; C. R. DeArman, sales promotion department; J. L. Williams, Boston district manager; G. H. Gaites, Pittsburgh district manager; E. L. Stilson, field engineer, and R. M. Walker, field engineer.

Philip Carey Co.

The exhibit of The Philip Carey Co. featured Asbestos Sponge pipe covering for high and medium pressure steam surfaces. This covering is recommended for unusual severe service condition on steam lines.

Chase Brass & Copper Co

The exhibit of the Chase Brass and Copper Company, displayed condenser tubes, copper tube and sweat fittings, copper bus tube, welded fittings and Kennecott wires and cables. Special sections of the display featured Condenser Tubes made of Chase Antimonial Admirality, a new patented Chase alloy, which resists both dezincification and sulphur cor-

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Printing Committee Makes Paper Awards

Contracts Let On Monday of This Week At Washington, D. C., For Supplying Government Printing Office For the Six Months Period, Beginning January 1, 1941 — List of Successful Bidders.

WASHINGTON, D. C., December 2, 1940—Joint Congressional Committee on Printing at a meeting today made awards for six months paper for the use of the Government Printing Office effective January 1, 1941. Bids for the awards were opened a week ago today. The awards announced were as follows;

No. 1, National Pulp and Paper Company, 2.75 cents (for 350,000 pounds only); Paper Corporation of U. S., 3.20 cents. (balance)

No. 3, Marquette Paper Company, 5.172 cents.

No. 4, Frank Parsons Paper Company, 5.172 cents.

No. 5, Marquette Paper Company, 5.172 cents.

No. 6, Frank Parsons Paper Company, 4.664 cents.

No. 7, Marquette Paper Company, 4.664 cents.

No. 8, Frank Parsons Paper Company, 4.664 cents.

No. 9, Marquette Paper Company, 4.664 cents.

No. 10, R. P. Andrews Paper Company, 5.30 cents.

No. 11, Frank Parsons Paper Company, 5.023 cents.

No. 12, Mudge Paper Company, 4.73 cents.

No. 13, R. P. Andrews Paper Company, 5.51 cents.

No. 14, Old Dominion Paper Company, 12.49 cents (100 lbs.) Stanford Paper Company, 13.50 cents (70 lbs.)

No. 15, Paper Corp. of U. S., 6.04 cents.

No. 16, R. P. Andrews Paper Company, 5.35 cents.

No. 17, R. P. Andrews Paper Company, 4.73 cents.

No. 18, Mudge Paper Company, 6.72 cents.

No. 19, Paper Corporation of U. S., 13.65 cents.

No. 20, Whitaker Paper Company, 9.96 cents.

No. 21, Whitaker Paper Company, 9.96 cents.

No. 22, Whitaker Paper Company, 9.96 cents.

No. 23, Paper Corporation of U. S., 11.67 cents.

No. 24, Paper Corporation of U. S., 17.97 cents.

No. 25, Paper Corporation of U. S., 17.47 cents.

No. 26, Frank Parsons Paper Company, 5.198 cents.

No. 27, Marquette Paper Company, 5.11 cents.

No. 28, Frank Parsons Paper Company, 5.092 cents.

No. 29, Marquette Paper Company, 4,762 cents.

No. 30, R. P. Andrews Paper Company, 4.65 cents.

No. 31, R. P. Andrews Paper Company, 4.65 cents.

No. 36, R. P. Andrews Paper Company, 6.54 cents.

No. 37, Mudge Paper Company, 12.81 cents.

No. 40, Old Dominion Paper Company, 9.97 cents.

No. 43, Whitaker Paper Company, 4.43 cents.

No. 44, Cauthorne Paper Company, Inc., 6.21 cents.

No. 47, Aetna Paper Company, 7.734 cents (2,500,000 lbs.); Old Dominion Paper Co., 7.82 cents (2,500,000 lbs.); Virginia Paper Co., 7.82 cents (1,000,000 lbs.); Old Dominion, 7.82 cents (overrun if need); Cauthorne Paper Co., 7.99 cents (overrun if necessary); Paper Co., of U. S. 7.96 cents (overrun if necessary)

No. 51, R. P. Andrews Paper Company, 11.26 cents.

No. 52, R. P. Andrews Paper Company, 10.26 cents (white) 11.15 cents (blue)

No. 53, Paper Corporation of U. S., 11.77 cents.

No. 54, R. P. Andrews Paper Company, 6.21 cents.

No. 55, R. P. Andrews Paper Company, 4.91 cents.

No. 56, Whitaker Paper Company, 4.91 cents (2,500,000 lbs.); R. P. Andrews Paper Co., 4.81 cents (2,500,000 lbs.)

No. 57, R. P. Andrews Paper Company, 5.86 cents.

No. 58, Whitaker Paper Company, 4.49 cents.

No. 59, R. P. Andrews Paper Company, 5.24 cents.

No. 60, Aetna Paper Company, 7.164 cents.

No. 61, Aetna Paper Company, 6.844 cents (250 tons); Old Dominion Paper Co., 6.9979 cents (remainder)

No. 62, Whitaker Paper Company, 5.59 cents.

No. 63, R. P. Andrews Paper Company, 22.19 cents.

No. 64, Old Dominion Paper Company, 9.739 cents.

No. 65, Stanford Paper Company, 10.40 cents.

No. 66, Mudge Paper Company, 12.03 cents.

No. 67, Mudge Paper Company, 11.73 cents.

No. 69, Barton, Duer & Koch Paper Company, 16.44 cents (200,000 lbs.); Paper Corp., of U. S., 17.35 cents (200,000 lbs.); Barton, Duer & Koch, 17.35 cents (overrun)

No. 70, Mathers-Lamm Paper Company, 7.35 cents

No. 71, Walker Goulard Plehn Company, 7.97 cents.

No. 73, Marquette Paper Company, 15.95 cents.

No. 74, Mudge Paper Company, 12.48 cents (300,000 lbs.), same 12.83 cents (300,000 lbs.); Barton, Duer & Koch Paper Co., 12.83 cents (200,000 lbs.); same 12.97 cents (200,000 lbs.); Standard Paper Co., 12.97 and 13.47 cents (overrun.)

No. 75, Marquette Paper Company, 17.25 cents.

No. 76, Barton Duer & Koch Paper Company, 13.02 cents.

No. 78, R. P. Andrews Paper Company, 26.43 cents.

No. 79, Barton, Duer & Koch Paper Company, 22.45 cents.

No. 83, Barton, Duer & Koch Paper Company, 14.93 and 15.97 cents (150,000 lbs., each including overrun); R. P. Andrews Paper Company, (100,000 lbs.), 15.50 cents.

No. 102, R. P. Andrews Paper Company, 5.69 cents.

No. 109, Stanford Paper Company, 10.67 cents.

No. 110, Graham Paper Co., 9.31 and 9.69 cents (each 400,000 lbs.); Virginia Paper Company, 9.70 cents (200,000 lbs.) overrun.

No. 111, Butler Company, 550 tons at 8.37 cents and 400 tons at 8.57 cents.

No. 112, Butler Company, 550 tons at 8.37 cents and 400 tons at 8.57 cents.

No. 113, Aetna Paper Company, 8.614 cents.
No. 114, Aetna Paper Company, 11.644 cents.
No. 115, Aetna Paper Company, 9.624 cents.
No. 116, Aetna Paper Company, 8.534 cents (200 tons); Baxter Paper Company, 8.96 cents (balance)
No. 117, Baxter Paper Company, 9.66 cents.
No. 120, Aetna Paper Company, 11.974 cents.
No. 121, Butler Co., 9.59 cents (500,000 lbs.); Aetna Paper Co., 9.464 cents (400,000 pounds); R. P. Andrews Paper Co., 9.77 cents (balance).
No. 122, R. P. Andrews Paper Company, 9.57 cents.
No. 123, Aetna Paper Company, 12.974 cents.
No. 125, Paper Corporation of U. S., 20.40 cents.
No. 126, Paper Corporation of U. S., 18.10 cents.
No. 128, Paper Corporation of U. S., 19.90 cents.
No. 129, Paper Corporation of U. S., 19.90 cents.
No. 140, Stanford Paper Company, 24.50 cents.
No. 141, Paper Corporation of U. S., 20.40 cents.
No. 151, Mudge Paper Company, 6.04 cents.
No. 152, Mudge Paper Company, 6.01 cents.
No. 154, Baxter Paper Company, 9.17 cents.
No. 155, Mathers-Lamm Paper Company, 9.65 cents.
No. 156, Mathers-Lamm Paper Company, 9.65 cents.
No. 157, Old Dominion Paper Company, 10.949 cents.
No. 160, Baxter Paper Company, 9.56 cents.
No. 161, Mudge Paper Company, 9.66 cents.
No. 162, Mudge Paper Company, 9.66 cents.
No. 163, Mudge Paper Company, 9.76 cents.
No. 164, Baxter Paper Company, 10.36 cents.
No. 165, Mudge Paper Company, 10.64 cents.
No. 168, Mudge Paper Company, 14.12 cents.
No. 169, Mudge Paper Company, 14.12 cents.
No. 170, Mudge Paper Company, 14.12 cents.
No. 171, Mudge Paper Company, 14.12 cents.
No. 172, Barton, Duer & Koch Paper Company, 15.45 cents.
No. 173, Barton, Duer & Koch Paper Company, 15.45 cents.
No. 176, Graham Paper Company, 18.39 cents.
No. 177, Graham Paper Company, 18.39 cents.
No. 178, Graham Paper Company, 18.39 cents.
No. 179, Graham Paper Company, 18.39 cents.
No. 180, Barton, Duer & Koch Paper Company, 18.92 cents.
No. 181, Barton, Duer & Koch Paper Company, 18.92 cents.
No. 184, Paper Corporation of U. S., 5.24 cents.
No. 190, Paper Corporation of U. S., 8.70 cents.
No. 191, Paper Corporation of U. S., 9.70 cents.
No. 192, Paper Corporation of U. S., 8.95 cents.
No. 193, Paper Corporation of U. S., 9.75 cents.
No. 196, Barton, Duer & Koch Paper Company, 17.88 cents.
No. 197, Mathers-Lamm Paper Company, 12.10 cents.
No. 198, No bids received.
No. 201, Barton, Duer & Koch Paper Company, 7.18 cents.
No. 202, Barton, Duer & Koch Paper Company, 7.53 cents (India only); and Butler Company, 7.66 cents (other colors).
No. 203, R. P. Andrews Paper Company, 7.03 cents.
No. 204, R. P. Andrews Paper Company, 7.07 cents.
No. 205, R. P. Andrews Paper Company, 10.37 cents.
No. 209, Cauthorne Paper Company, 4.45 cents.
No. 210, Old Dominion Paper Company, 4.234 cents.
No. 211, Paper Corporation of U. S., 5.80 cents.
No. 213, R. P. Andrews Paper Company, 18.00 cents.
No. 214, R. P. Andrews Paper Company, 17.00 cents.
No. 215, Mudge Paper Company, 17.50 cents.
No. 217, R. P. Andrews Paper Company, 4.38 cents.
No. 218, R. P. Andrews Paper Company, 4.38 cents.
No. 219, R. P. Andrews Paper Company, 4.13 cents.
No. 220, Old Dominion Paper Company, 5.94 cents.
No. 251, Nashua Gummed and Coated Paper Company, 11.90 cents.
No. 252, Whitaker Paper Company, 11.49 cents.
No. 254, Stanford Paper Company, 5.20 cents.
No. 255, Butler Company, 6.2444 cents.
No. 256, Cauthorne Paper Company, 6.83 cents.
No. 257, Stanford Paper Company, 7.20 cents.
No. 258, Whitaker Paper Company, 5.81 cents.
No. 259, R. P. Andrews Paper Company, 5.33 cents.
No. 260, Cauthorne Paper Company, 9.38 cents.
No. 261, Bids rejected.
No. 262, R. P. Andrews Paper Company, 7.25 cents.
No. 263, Barton, Duer & Koch Paper Company, 7.50 cents.
No. 264, Barton, Duer & Koch Paper Company, 4.24 cents.
No. 265, Mudge Paper Company, 7.00 cents.
No. 271, Paper Corporation of U. S., 5.84 cents.
No. 276, Barton, Duer & Koch Paper Company, 7.75 cents.
No. 277, Barton, Duer & Koch Paper Company, 8.75 cents.
No. 280, Mathers-Lamm Paper Company, 8.60 cents.
No. 281, Bartgis Brothers Company, 4.375 cents.
No. 302, Old Dominion Paper Company, $22.74 per M sheets.
No. 303, Whitaker Paper Company, $32.85 per M sheets.
No. 304, Old Dominion Paper Company, $45.14 cents per M sheets.
No. 305, Paper Corporation of U. S., $29.04 per M sheets.
No. 306, Barton, Duer & Koch Paper Company, 4.65 cents.
No. 307, Barton, Duer & Koch Paper Company, 5.25 cents.
No. 308, Old Dominion Paper Company, 4.984 cents.
No. 309, Old Dominion Paper Company, 4.984 cents.
No. 310, Barton, Duer & Koch Paper Company, 5.00 cents.
No. 325, Whitaker Paper Company, 4.64 cents (1,000 tons); R. P. Andrews Paper Company, 4.69 cents (1,000,000 lbs.); same firm, 4.79 cents (500,000 lbs.)

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Thilmany Co. Announces Wage Increases

Contract Negotiated With Unions Last June Results In Wage Increases Granted By Thilmany Pulp & Paper Co. of About 5 Per Cent Effective Dec. 1—Paper Mill Employment Off—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 2, 1940—Wage increases of approximately five per cent to hourly paid employees are announced by the Thilmany Pulp and Paper Company, Kaukauna, Wis. They are in effect as of December 1, and affect about 900 employees.

The company negotiated a contract with the labor unions last June involving an increase in wages and a plan of vacations with pay, and intimated at that time that further increases might be made if conditions warranted.

A new first aid department has been established at the Thilmany mill and was opened for public inspection last week. It is located in rooms beneath the main office, occupying space formerly used for the printing department, now housed in the former Union Bag and Paper Company building. The layout includes a large waiting room, an examination room and a rest room, all equipped for examinations and treatment of injuries. A first aid room also is maintained next to the pulp mill office for the benefit of workers in that building. Mrs. Hazel Leedke, industrial nurse, is in charge, and also makes calls on employees confined to their homes.

Work on New Cannard Building Starts

Work has been started at Little Chute, Wis., on a building for the Cannard Manufacturing Company of Green Bay, Wis., manufacturer of paper converting machines. The structure is one story, 60 by 127 feet in size, It is expected to be ready for occupancy by January 1. The building is being erected by the Little Chute Business Men's Association, after negotiating with the Cannard company to move its plant to the village.

Paper Mill Employment Declines

Employment for the state as a whole in the manufacture of paper and allied products showed a decline of one per cent for October as compared to September, according to estimates of the statistical department of the Wisconsin Industrial Commission, Madison, Wis. This is the second month of tapering off. The estimated number of wage earners in October was 22,000, as compared with 22,200 in September and 22,300 in August.

This trend was reflected in the estimated weekly payrolls, which were off 0.3 per cent. They were $595,000 in August, $589,000 in September and $587,000 in October. Average earnings per worker per week now stand at $26.72 for an average of 41.3 hours, with an average hourly rate of 64.8 cents.

In the Milwaukee area, largely devoted to converting and specialties, the trend was opposite. Twenty-two concerns reported 2,145 employees on payrolls, a gain of 1.7 per cent for October over September. Payrolls totalled $54,398, a gain of 6 per cent over September. The average weekly pay is lower than that for the state, however, showing $25.36 for an average of 41 hours, at an average hourly rate of 61.8 cents.

Consumer trends show gains. The printing, publishing and allied industries reported 9,800 persons employed, 2.2 per cent higher than September with 9,600 and August with 9,500. Payrolls showed increases from $315,000 per week in August to $322,000 in September and $328,000 in October, or a gain of 1.8 per cent in October over the previous month. Weekly average earnings are $33.57 for 38.8 hours at 86.5 per hour.

Marathon Gets Bottle Seal Rights

Marathon Paper Mills Company, Rothschild, Wis., has acquired patent rights on a tamperproof bottle seal made of Parafilm, a Marathon product. It consists of a piece of Parafilm shrunk under heat over the cap and neck of the container, leaving tampering easy of detection.

The patent was granted to Allen Abrams and George W. Forcey, Wausau, Wis., and Clinton A. Sheldon, Bronxville, N. Y., who made application July 10, 1937. Its award was announced last week, and has been assigned to the Marathon company.

Coal Freight Rates Equalized

Railroad freight rates on coal shipped into Wisconsin in carload lots from out-of-state points bordering the state have been ordered equalized permanently, according to an order issued by the Interstate Commerce Commission last week. A temporary order formerly was in effect. Thus coal landed at Great Lakes docks at Menominee and Escanaba, Mich., will take the same rate to Wisconsin cities as applied to Marinette, Wis., on the border line nearby. Shipments from Duluth, Minn., will apply the same rates as at Superior, Wis., located across the river.

Barge shipment of coal from Green Bay, Wis., to mills along the Fox River was suspended for the season November 27, when the War Department ordered navigation to close until spring.

Annual Safety Conference Slated for Next May

The annual Fox River Valley and Lake Shore Safety Conference, the big safety event of the year for paper mills and allied industries, will be held at Fond du Lac, Wis. May 22, 1941. This decision was reached at a meeting of the advisory committee at Fond du Lac last week. Preparations will be made for sectional meetings for the pulp and paper industry, and for prominent speakers at the general sessions.

Notice to Patten Paper Creditors

Creditors of the defunct Patten Paper Company, Ltd., Appleton and Kaukauna, Wis., have been given until December 16, 1940 to file their claims, according to notice of Paul V. Cary, trustee. An extension was asked recently and was granted by the United States Court for the Eastern District at Milwaukee, Wis. last week.

WholesalePaperDemandReportedModerate

Midwest Paper Men Expect Some Weakness In Market As Inventory Taking Period Nears—Groundwood and Newsprint Grades Most Active This Week—New Sales Tax Suit On Paper Products.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 2, 1940—The Chicago paper market drifted into the final month of 1940 with mingled feelings of pride and disappointment. Despite tremendous upheavals in the world picture which directly affected the materials market, the paper market here held on a fairly even keel, conducted itself properly during the "hysteria" days and has since worked diligently to keep the general market within a constructive range. From now until the end of the year local executives expect the market to show some weak spots, attributed more to the nearness of inventory taking and continued postponement of the effect of general business improvement.

Specifically, groundwoods were reported as in fair demand while the newsprint market commitments were said to be favorable. Sulphites had an uneventful week for the most part with the market holding around its previous position and buying slow. Books and covers made a bit more headway reflecting preparations for 1941 merchandising procedure. Bonds and ledgers showed no indication of producing any marked change. Waste papers were unchanged for the most part with the exception of some reported weaknesses in krafts.

Paper Man on Credit Committee

According to local credit executives of paper jobbing firms, plans are being formulated for active participation of the paper industry in the forthcoming Credit Congress to be held in New Orleans next May. Credit executives of the fine paper houses of the country are very much interested in the program of the National Association of Credit Men and in the general effort to unify an interchange of credit procedure for the betterment of all business. Heading the list of fine paper credit executives from this area who are working on Congress details is A. R. Martin, Jr., of Bradner Smith & Company who is one of a committee of credit men making arrangements for the New Orleans session. H. C. Steward of Whitaker & Company of Cincinnati is general chairman of the group working out paper industry cooperation at the May sessions.

Whitaker Adds New Lines

Two new coated book papers, recently added to their representative line, have been publicized widely by the Whitaker Paper Company. One of these is Imperial Enamel which is described as exceptionally good for fine screen reproduction use. The other is White Bear Enamel, a popular price paper which has already attracted much attention. Hamilton Ledger is another item recently added by the Whitaker organization.

Westvaco Exhibits at Meeting

With J. C. Reynolds, western sales manager, in charge, the West Virginia Pulp and Paper Company provided the only representation of the paper industry at the recent annual meeting and exhibition sponsored by the Outdoor Advertising Association of America which was held in Chicago. Mr. Reynolds supervised Westvaco exhibits designed to further portray the "Poster Paper-Poster Service" theme of this branch of the Westvaco business.

Salesmen Plan Football Feature

The midwest division of the Salesmens Association of the Paper Industry must have cracked an attendance record or two at its regular Monday meeting when Lynn Waldorf, coach of the Northwestern University football team, showed the movies of the Notre Dame-Northwestern game to Wailing Wall advocates with whom the paper sales executives meet weekly. Attendance records should get a further knock next Monday at the Hotel Sherman when Tommy Harmon, Michigan star, gets the Wailing Wall trophy for the most valuable back in the Conference.

Paperboard Meeting Most Successful

From the Chicago headquarters of the National Paperboard Industries Association comes the news that the annual convention held ten days ago in New York City was considered among the most successful ever held. The analysis of the Association's progress during the past year was made by Alan G. Goldsmith, vice president of the Association, in the absence of Colonel H. W. Ellerson, president. F. G. Becker, executive manager, and H. S. Adler, secretary of the Association were both re-elected while C. E. Nelson, president of the Mac Sim Bar Paper Company was elected president and G. E. Dyke, president of Robert Gair & Company, vice president of the organization. Four new members were officially inducted into the association at the time of the New York meeting. It was reported here that the paperboard manufacturers expected business to improve about 6 per cent in 1941 and felt that 1940 had been a good year, especially after considering all the unusual factors affecting development.

New Sales Tax Suit on Paper

The Department of Finance, which handles Illinois sales tax matters; reports another suit which has a direct effect on the paper industry. The Robertson Products Company has brought suit against the department to determine whether or not the tax should apply on paper napkins, towels, paper cups and other products sold to hotels and other sources where such materials are provided for the convenience of the guests. The argument offered by the Robertson firm is said to be that the hotel or club is not the ultimate consumer of the product and that therefore the tax should not apply on the firm selling the product to the hotel.

MANY INNOVATIONS EXHIBITED AT POWER SHOW

(Continued from page 7)

rosion, and Kennecott Formvar Magnet Wire, a tough, flexible magnet wire which resists abrasion.

In attendance were, G. A. Noerager, D. W. Krueger, H. B. Garnaus, J. J. Condon, G. T. Underhill, E. A. Taylor, F. R. Meier, A. P. Kirk, L. F. Col, E. S. Rising, W. J. Dorey, J. J. Vreeland, J. Babin, A. E. Moredock, W. E. Evans, H. L. Burghoff, H. B. Coe, and N. W. Mitchell.

E. I. DuPont de Nemours & Co.

At the exhibit of E. I. DuPont de Nemours & Co., Neoprene putty for lining tanks, etc. was featured. Many industrial uses for Neoprene or chloroprene rubber was shown, including applications for sheet packing, gaskets, seals, covering of conveyor belting and for diaphragms, such as in automatic switches, and flow valves.

Fairbanks Co.

The exhibit of The Fairbanks Co. featured the new "Sphero" valves. This type of valve possesses the features of accessibility, adjustability and positive, economical operation. It requires only a quarter turn to open or close and provides a clear, unobstructed portway. It is particularly adapted for digester blow-offs, relief and test valves, pulp, sulphate and sulphite lines, steam and water supply to boilers.

Foxboro Co.

The exhibit of The Foxboro Co. featured the Model 30 Stabilog, with flush case and single horizontal gauge with input and output recordings. Of particular interest to the paper and pulp industry was the company's 6-inch dial type flow meter of all metal construction. Also on view were thermometers and humidity recorders.

Grinnell Co.

At the exhibit of the Grinnell Co. were featured prefabricated piping, welding fittings, adjustable pipe hangers, "Thermolier" unit heaters, cast iron pipe fittings, air furnace malleable iron fittings, "Superseal" flared fittings, "Thermoflex" heating specialties, automatic sprinklers and Genspring constant-support hangers.

Hills-McCanna Co.

The exhibit of the Hills-McCanna Co. featured the company's Type "R" pump, which meets the need for a small capacity, ruggedly constructed, medium pressure service on caustic and acid proportioning, etc. where accurate metering is desired. The company's "U" Type pump and line of diaphragm valves were also displayed.

Representatives present included D. M. McDowell, R. R. Lynn and P. R. Paulson.

International Nickel Co.

At the exhibit of The International Nickel Company, samples were on display of various high nickel alloys and low nickel alloys, selected from products of manufacturers' equipment built for service in the power and mechanical engineering fields. Also displayed were actual parts of equipment representing current commercial uses for Monel, "K" Money, "S" Monel, Inconel, pure nickel, nickel-bronze, nickel chromium and other nickel alloys. L. Miller-Thym was in charge of the exhibit and a number of representatives were present to discuss technical problems.

Johnson Corp.

At the exhibit of The Johnson Corp. the featured display was the company's "Electrap" for pumping and lifting services. Also on view was the Johnson rotary pressure joint, requiring no packing, oiling or adjusting and suitable for pressures up to 150 pounds and speeds up to 600 r.p.m. This joint is designed for all types of rotary drying and cooling cylinders.

In attendance were representatives from the Advance Engineering Co., New York and R. O. Monroe and R. W. Gotschall of the Johnson Corporation.

Leeds & Northrup Co.

The exhibit of the Leeds & Northrup Co. featured the "Micromax" system of electric control for superheat temperatures; strip chart temperature recorder, with daily removable chart. Pictures were on display showing typical installations of the "Metermax" combustion control instruments within a steam plant.

Link-Belt Co.

The exhibit of the Link-Belt Company included operating units of silent and roller chain drives and the Link-Belt P.I.V. Gear variable speed transmission.

The newly designated line of "Friction Fighter" bearing units, was featured by a multi-sided revolving display on which sample ball and roller bearing mountings will appear with their respective fighter symbols — Flyweight, Welterweight, Middleweight, Heavyweight, and Alternate Heavyweight.

Representatives in attendance included Horace Bowman, H. D. Mitchell, W. H. Kinkead, D. H. Renfrew, Philadelphia; C. V. Loughery, G. H. Woody, Indianapolis; A. J. Drew and others from the company's New York office.

Mason-Neilan Regulator Co.

The exhibit of the Mason-Neilan Regulator Company included the company's unique travelling laboratory for demonstrating the operation of Masoneilan Automatic Control Equipment for all industrial processes.

Representatives in attendance were: F. K. Morrison, Carl Gram, W. P. Gearon, H. P. Northrop, G. S. Schlecter and E. P. Head.

Nash Engineering Co.

The exhibit of the Nash Engineering Company featured a large and a small glass centrifugal pump, both of which were in operation. There were also on display a vapor turbine heating pump, a Liquid-Nash compressor and a Clean Air compressor, all of which were in operation. Other equipment included a double suction centrifugal pump, a return line vacuum heating pump and various pump parts.

Representative in attendance included I. C. Jennings, E. A. Mead, W. M. Thomson, A. W. Winship, C. J. Lyons, W. W. Hickey, J. B. Wright, T. L. Johnson, F. W. Green, H. E. Adams, J. R. Mc-

(Continued on page 14)

Obituary

John T. Foley

John Thomas Foley, 29, vice-president of the C. J. Foley Paper Company, 228 North La Salle street, Chicago, and a well known athlete, was killed in an automobile accident at Evanston, Ill., November 16. He was returning from a tennis dinner at the Exmoor Country club.

A member of Exmoor, young Mr. Foley was an active participant in all sports at the club. He was an excellent skater and at one time was a member of Sonja Henie's troupe and appeared in her picture, "Happy Landing." Only a month ago he joined Miss Henie and her husband, Dan Topping, for luncheon on their recent visit in Chicago.

Mr. Foley was graduated from Evanston High School in the class of '29, and in his senior year captained the varsity football squad. He was graduated from the University of Illinois in 1933 and was a member of Phi Delta Theta. After graduating he joined his father in the business of C. J. Foley Paper Company.

Surviving, in addition to his parents, are two sisters, Mrs. J. H. Gleason of Highland Park and Miss Darlene Foley, who lives at home.

Following a funeral service at the home Monday morning, a requiem high mass was celebrated at St. Mary's church. Burial was in All Saints' cemetery.

Joseph LaFarr, Sr.

Joseph LaFarr, Sr., 85, for many years yard superintendent at the Fort Edward mill of the International Paper Company, died November 22, at his home in McCrea street, Fort Edward, N. Y., after an illness of five weeks. Surviving are three sons, George, Frank E. and Fred LaFarr of Fort Edward; eight daughters, Misses Elizabeth, Lena and Rachel LaFarr, Mrs. Everett Lewis and Mrs. Edward Doyle of Fort Edward, Mrs. Michael Cahill and Mrs. James Lindsey of Hudson Falls and Mrs. Carolyne Tidmarsh of Glens Falls; 39 grandchildren, thirty great-grandchildren and three great-great-grandchildren.

The funeral was held from St. Joseph's Church and interment was in the parish cemetery at Fort Edward.

Gen. A. S. Fleming

Brig. Gen. Adrian S. Fleming, U. S. A. (retired), vice-president of the Columbia Pulp and Paper Company, died on December 1 at Portland, Ore. He was sixty-seven years old.

He was vice-president of the Columbia River Paper Company, the Columbia River Paper Mills, the Oregon Pulp and Paper Company and the California-Oregon Paper Mills.

Gen. Fleming was born in Midway, Ky., and was graduated in 1895 from the United States Military Academy at West Point. He was sent to the Philippine Islands in 1898 with the 6th Artillery and remained in the islands throughout the insurrection. He was cited in 1899 for gallantry in action near Manila and at the Calumpit River.

In 1905 he was graduated from the School of Submarine Defense, in 1912 from the Army School of the Line in the field officers' course and, in 1920, from the General Staff College.

He served with the A. E. F. from June, 1918, to May, 1919. During the Meuse-Argonne offensive he was in action with the 17th French Corps and the 29th, 32d and 91st Divisions of the American forces. He was assigned to the General Staff Corps in 1920 and was retired at his own request in 1921 with the rank of brigadier general in the Officers' Reserve Corps. He was an officer of the French Legion of Honor.

Surviving is his widow, the former Miss Mabel V. Gassen, of San Diego, Cal.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Dec. 4, 1940—Government Printing Office has received the following bids for 15,800 pounds (80,000 sheets) of 50 per cent rag, 35 x 44 white bond paper; R. P. Andrews Paper Company, 10.95 cents; Aetna Paper Company, 10.63 cents; Mudge Paper Company, 10.43 cents; Paper Corp. of U. S., 11.65 cents; Mathers-Lamm Paper Company, 13.89 cents; Cauthorne Paper Company, 10.97 cents; and Old Dominion Paper Company, 15.09 cents.

For 53,800 pounds (200,000 sheets) of 38 x 48 supercalendered book paper; R. P. Andrews Paper Company, 5.32 cents; Barton, Duer & Koch Paper Company, 5.87 cents; Stanford Paper Company, 5.27 cents; Whitaker Paper Company, 5.57 cents; Mudge Paper Company, 5.40 cents; Frank Parsons Paper Company, 5.35 cents; and Old Dominion Paper Company, 5.533 cents.

For 73,000 pounds (600,000 sheets) of 28 x 34 white sulphite writing paper; Whitaker Paper Company, 5.75 cents; Mudge Paper Company, 6.13 cents; R. P. Andrews Paper Company, 4.95 cents; Barton, Duer & Koch Paper Company, 5.67 cents; Stanford Paper Company, 6.44 cents; Old Dominion Paper Company, 6.653 cents; Eastern Corporation, 5.75 cents; Mathers-Lamm Paper Company, 6.25 cents; and Perkins-Goodwin Company, 5.53 cents.

For 35,000 pounds of 24 x 36 rope manila; R. P. Andrews Paper Company, 16.4 cents.

For 14,400 pounds (150,000 sheets) of 20 x 25 granite smooth M.F. cover paper; Marquette Paper Company, 6.85 cents; Mudge Paper Company, 7.17 cents; R. P. Andrews Paper Company, 7.23 cents; Barton, Duer & Koch Paper Company, 7.99 cents; Stanford Paper Company, 7.25 cents; Cauthorne Paper Company, 6.84 cents; and Paper Corp. of U. S., 7.86 cents.

For 5,000 pounds of 50 per cent rag, blue index paper; Barton, Duer & Koch Paper Company, 14.16 cents; R. P. Andrews Paper Company, 11.37 cents; Walker-Goulard-Plehn Company, 14.18 cents; Paper Corp. of U. S., 14.2 cents; and Cauthorne Paper Company, 11.38 cents.

For 78,000 pounds of 25 per cent rag, white bond paper; Aetna Paper Company, 9.94 cents; Barton, Duer & Koch Paper Company, 12.987764 cents; R. P. Andrews Paper Company, 10.75 cents; Walker-Goulard-Plehn Company, 10.13 cents; Mudge Paper Company, 10.04 cents; Old Dominion Paper Company, 11.937 cents; Paper Corp. of U. S., 10.9 cents; Graham Paper Company, 10.4 cents; and Cauthorne Paper Company, 10.77 cents.

N. P. T. A. Announces Winners

The National Paper Trade Association announces the following list of winners submitting the best answers to question No. 5, "How do you use current rising prices as a factor in your selling?"

First prize—W. H. Carey, Crescent Paper Company, Indianapolis, Ind. Second prize—H. C. Tatman, Standard Paper Company, Tacoma, Wash. Third prize—Don Van Ostenberg, Beecher, Peck & Lewis, Detroit, Mich.

Fourth to eighth prize winners:—W. S. Knox, Knox & Schneider, Chicago, Ill.; J. T. Constantine, Andrews Paper House of York, York, Pa.; Leon Nack, A. E. MacAdam & Co. Inc., Brooklyn, N. Y.; R. S. Smith, Lehigh Valley Paper House, Allentown, Pa.; C. H. Gravett, The Scioto Paper Co., Columbus, Ohio.

Honorable mention:—Gordon DeBerg, Spokane Paper and Stationery Company, Spokane, Wash.; R. M. Bowers, Mayer Myers Paper Company, Memphis, Tenn.; W. E. Boyer, Andrews Paper House of York, York, Pa.; A. L. Hilscher, Spokane Paper and Stationery Company, Spokane, Wash.; D. L. Jones, Roach Paper Company, Little Rock, Arkansas; L. W. Knoblach, Lehigh Valley Paper House, Allentown, Pa.; R. R. Murphy, Peterson Paper Company, Davenport, Iowa; W. S. Roe, B. F. Bond Paper Company, Baltimore, Md.; Raymond Sellon, American Paper Company, Milwaukee, Wis.; A. H. Whitley, Jr., Parker Paper Company, High Point, N. C.; F. H. Woolger, Berkshire Papers, Inc., Chicago, Ill.

The National Paper Trade Association announces the following list of winners submitting the best answers to question No. 6, "Sorry, but I've decided to place this order with the Blank Company!"

First prize—Charles H. Gravett, Scioto Paper Company, Columbus, Ohio. Second prize—S. R. Spencer, Spokane Paper and Stationery Company, Spokane, Wash. Third prize—R. N. Benham, Wilcox-Mosher-Leffholm Company, Minneapolis, Minn.

Fourth to eighth prize winners:—W. M. Rohlfs, Terminal Paper Company, Philadelphia, Pa.; L. H. Morgan, Andrews Paper House of York, York, Pa.; R. L. Clark, A. E. MacAdam & Co. Inc., Brooklyn, N. Y.; F. C. Anderson, Wilcox-Mosher-Leffholm Co., Minneapolis, Minn.; H. J. Noth, Peterson Paper Company, Davenport, Iowa.

Honorable mention:—G. H. Crawford, Stone & Forsythe Company, Boston, Mass.; W. W. Gaudreau, Standard Paper Company, Tacoma, Wash.; A. F. Harder, Knox & Schneider, Chicago, Ill.; A. J. Klein, Wilder Bros. Company, Philadelphia, Pa.; Lawrence Knoblach, Lehigh Valley Paper House, Allentown, Pa.; W. S. Knox, Knox & Schneider, Chicago, Ill.; Leon Nack, A. E. MacAdam & Co. Inc., Brooklyn, N. Y.; M. Ralph Schafer, Beecher, Peck & Lewis, Detroit, Mich.; C. B. Thorpe, Crescent Paper Company, Indianapolis, Ind.; C. M. Watterson, Peterson Paper Company, Davenport, Iowa; A. H. Whitley, Jr., Parker Paper Company, High Point, N. C.

Philadelphia Association To Meet

PHILADELPHIA, Pa., December 2, 1940—The regular monthly luncheon meeting of the Philadelphia Paper and Trade Association will be held on Monday, December 9 at Down Town Club in the Ledger Building. Robert Ziegler, sec. of the wrapping paper division of the National Association, will speak.

EXHIBITED AT POWER SHOW

(Continued from page 12)

Intyre, G. B. Wright, R. H. Carpenter, R. Donnelly, A. P. Smith, D. Parker, C. C. Hunter and C. Vicario.

J. E. Rhodes & Sons

The display of J. E. Rhodes & Sons was designed to show the company's Tannate Watershed Leather Belting. One of the features was a small group drive, mounted in the back panel, with two transparent photographs on each side, with side panels showing two large revolving wheels, turned by a crank. Each wheel presented six charts pointing out the merits of the company's products.

Representatives in attendance included J. Edgar Rhodes, Richard H. Rhodes and S. L. Allen of the Philadelphia office, and H. T. Darlington, C. S. Wilson, C. D. Wright, A. N. Lamb, G. J. Schuellein and J. J. Merz of the New York force.

SKF Industries, Inc.

The exhibit of SKF Industries, Inc., displayed a complete line of ball and roller bearings. Headquarters were maintained at Hotel Lexington, and attending were R. H. DeMott, R. C. Byler, F. E. Ericson, D. H. McAllen, Ben Anderson, Henry Dimmick, Paul Carlson, J. D. Williamson, H. Wood, C. A. Decker, W. B. Ashland, J. C. Gayler and W. F. Hagen.

Socony-Vacuum Oil Co.

The display of the Socony-Vacuum Oil Co. featured industrial lubrication. On display were models of transparent "Lucite" which showed the proper lubrication of cylinders, bearings, etc. A transcribed talk on lubrication was given, at which visitors were provided with individual ear phones.

Taylor Instrument Companies

The exhibit of Taylor Instrument Companies included the company's standard line of indicating, recording and controlling temperature, pressure and flow instruments. Also on display were industrial thermometers, air operated diaphragm valves, pneumatic remote transmission for controlling temperatures, pressure and flow at remote points.

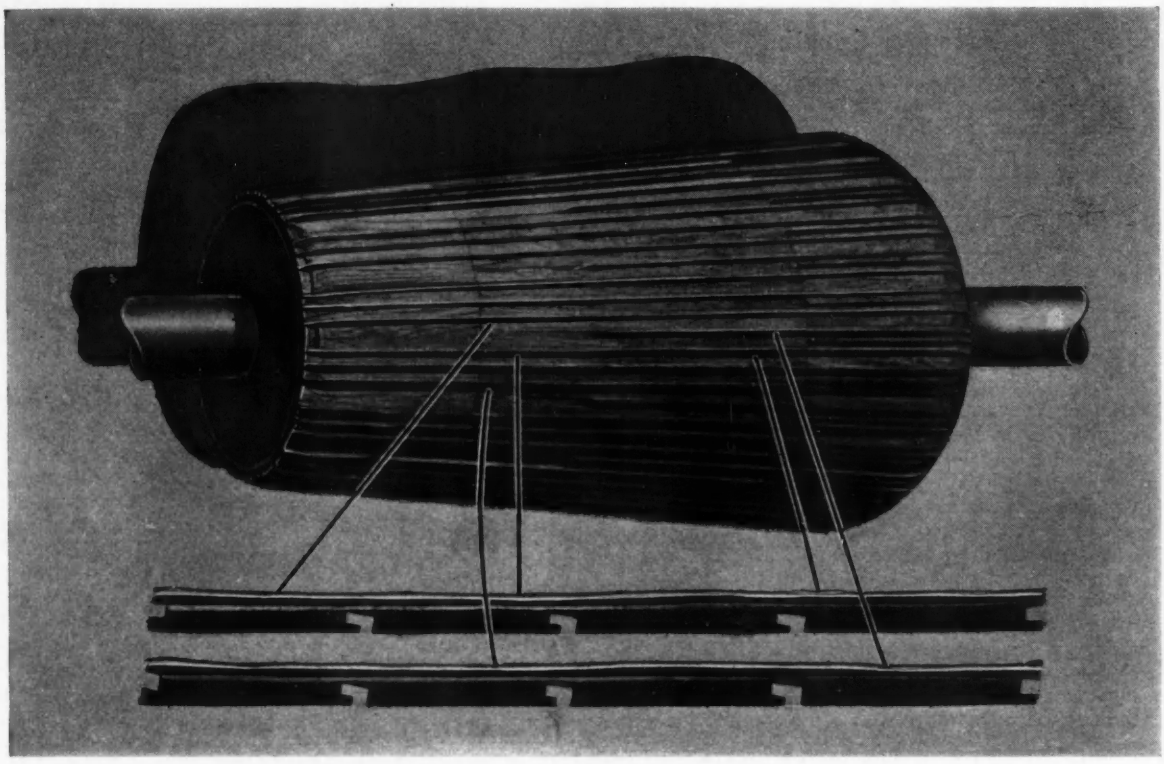
Representatives in attendance included J. W. Schwarz, George Heller, K. P. Coachman, H. A. Irving, E. C. Taylor, W. N. Maurer, J. P. Gilmore and R. G. Ellis.

Walworth Co.

At the exhibit of the Walworth Co. the company's Series 1500, motor operated, welding end, cast steel valve was featured. Of particular interest to the paper and pulp industry was an exhibit showing the "Walseal-Silbraz" joint on valves and fittings. A line of pulp mill valves and standard lines of valves and fittings in iron, brass and steel were also in display.

Britain Cuts Newsprint Imports

A cable from London states that the importation of 200,000 tons of newsprint next year, compared with 325,000 tons this year, will be permitted by the government. It was explained that there will be a newsprint surplus of 70,000 tons from this year.



Wavy Plug Wear that wasn't necessary... A Plug that could still be in use if a Jones *Nowave* Filling had been used

Power Applied For

Here is a familiar and unnecessary trouble found in most paper mills . . . an expensive plug filling ruined after short use. Wavy bars . . . an expense and waste that could have been prevented by use of Jones Nowave Fillings.

Yes, the above illustration shows how your Jordan plug bars may appear *if you are not using Jones Nowave Fillings.* Such imperfect plug and shell alignment will occur after a short period of use, causing short filling life and poor refining of stock. Jones Nowave Fillings provide perfect plug and shell alignment and therefore perfect contact throughout the life of bars, resulting in longer filling life and better and more uniform refining with resultant product improvement.

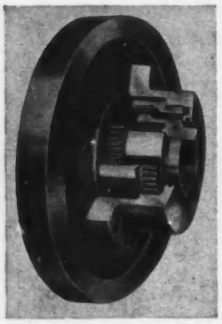
Jones

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

Manger Coupling

To save space and at the same time secure full flexibility—a necessary combination in certain applications—the Manger Flexible Coupling has been designed and developed by Farrel-Birmingham Company, Inc., Buffalo, N. Y. For connecting a shaft directly to a flywheel, brake drum or flange the manger coupling provides complete flexibility with approximately one-half the axial clearance required by other types of couplings. Moreover, the dummy, pilot or stub shaft generally necessary with other types of couplings is eliminated.



The manger coupling is equally applicable for connecting two free-ended shafts in combination with a solid, flanged, half coupling, which gives a remarkably close-coupled connection.

When two units are coupled to a single driver with manger couplings it is possible to operate one unit by unbolting the coupling and drawing back the outer sleeve on the unit which is not to be used. As the hub on the driver is solid, there are no loose parts to interfere with the free rotation of the driving shaft.

In connecting shafts of different diameters, the manger coupling, or flexible member, is mounted on the smaller shaft and bolted to a rigid, flanged, half coupling on the larger shaft. Since the size of the flexible member is determined by the size of the smaller shaft, a smaller and lower priced coupling can be used.

In the manger coupling, compensation for misalignment is made by an internal sleeve which floats between an externally geared hub and an internally geared covering sleeve. The internal sleeve, which engages the hub and outer sleeve, is free to slide and rock, adjusting perfectly for differences in alignment. The driving member of the coupling can be either the geared hub or the covering sleeve.

Gear teeth are accurately generated on Farrel-Sykes machines. External teeth are crowned, which gives full freedom to the floating sleeve within the design limits of the coupling. Compensation is provided for offset, angular and combined misalignment without resistance to free lateral float of the connected shafts. Contact areas are large and heavy oil lubricating the contact surfaces provides a cushion against shock without using flexing materials.

The manger coupling is suitable for all usual applications and to many special applications as well, such as the following: Connecting a shaft to an engine flywheel; connecting one shaft to another which carries an overhung brake drum; connecting shafts of different diameters; connecting driving shaft to roll or pinion stand when radial clearance is insufficient for a standard coupling; and combined with a magnetic or pneumatic clutch coupling.

Rayonier Pulp Prices Unchanged

Rayonier Inc. announced that there will be no increase or change in their dissolving and paper pulp prices for the first quarter of 1941.

Shippers' Association Meets

PHILADELPHIA, Pa., December 2, 1940—Celebrating its fourth anniversary the Delaware Valley Paper Shippers' Association met at dinner in the Rittenhouse Hotel this evening at 7 o'clock. Preceding the dinner a business meeting was held at which election of officers for 1941 took place. Virtually the entire personnel which served for 1940 was re-elected, comprising Daniel Bustraan, Paterson Parchment Paper Company, chairman; William A. Mercurio, Riegel Paper Corporation, vice-chairman; John A. Butterworth, W. O. Hamilton & Sons, secretary-treasurer; John A. Stevens, Thos. M. Royal & Co., and Ralph B. Thomas, Dill & Collins, Inc., Executive Committee, with the addition of M. Kardon of American Bag and Paper Company who was elected to the Executive Committee.

The Delaware Valley Paper Shippers' Association is a voluntary organization of paper mills, converters and merchants who pool their products for shipment to all parts of the country. The membership includes: American Bag and Paper Company, Philadelphia, D. M. Bare Paper Company, Roaring Spring, Pa., Benj. C. Betner Company, Devon, Pa., S. J. Burgoyne & Sons, Philadelphia, Cellulose and Paper Converting Company, Philadelphia, Clinton Paper Company, Lock Haven, Pa., A. M. Collins Manufacturing Company, Philadelphia, Curtis Paper Company, Newark, Del., C. B. Daring Paper Manufacturing Company, Bridgeport, Pa., Dill & Collins, Inc., Philadelphia, Glassine Paper Company, West Conshohocken, Pa., P. H. Gladfelter Company, Spring Grove, Pa., Goldman Paper and Paper Stock Company, Philadelphia, W. C. Hamilton & Sons, Miquon, Pa., Hamersley Manufacturing Company, Garfield, N. J., International Paper Company, New York, Jessup & Moore Paper Company, Philadelphia, Geo. La Monte & Son, Nutley, N. J., E. Latimer, Jr., Philadelphia, Lowe Paper Company, Ridgefield, N. J., Matthias Paper Corporation, Philadelphia, National Metal Edge Box Company, Philadelphia, National Waterproofing Company, Camden, N. J., Paper Manufacturers Company, Inc., Philadelphia, Paterson Parchment Paper Company, Bristol, Pa., Penn Card and Paper Company, Philadelphia, the Racquette River Paper Company, Potsdam, N. Y., Riegel Paper Corporation, New York, Thomas M. Royal & Co., Philadelphia, Sabin Robbins Paper Company, Philadelphia, Schmidt & Ault Paper Company, York, Pa., The Shallcross Company, Philadelphia, Springfield Coated Paper Company, Camden, N. J., Standard Paper Manufacturing Company, Richmond, Va., S. Walter, Philadelphia, Whiting Paper Company, Philadelphia, Wolf Brothers, Philadelphia, and Wyomissing Glazed Paper Company, Reading, Pa.

John A. Butterworth, secretary-treasurer of the association states that in 1939 the association shipped a total of twenty-two and one-half million pounds, and in 1940 for the first ten months an aggregate of twenty-four million pounds were shipped.

Volney Richmond Sr. on Soundview Board

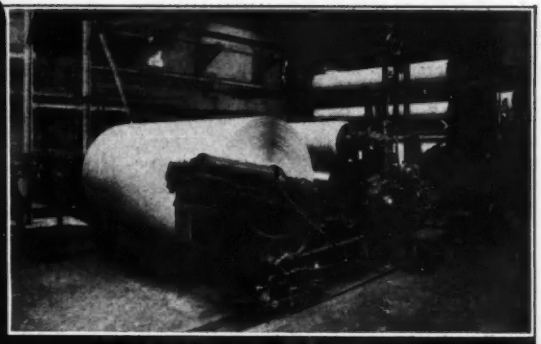
Volney Richmond, Sr., president of the Northern Commercial Company, Alaska mercantile firm in Seattle, has been elected to the board of directors of the Soundview Pulp Company. Richmond succeeds the late Stuart Rawlings of San Francisco on the Soundview board.

BELOIT

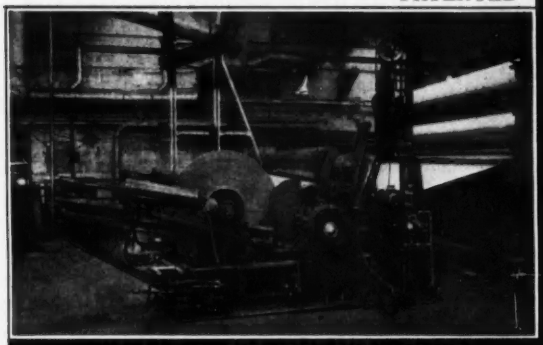
BOARD MACHINE

Reel

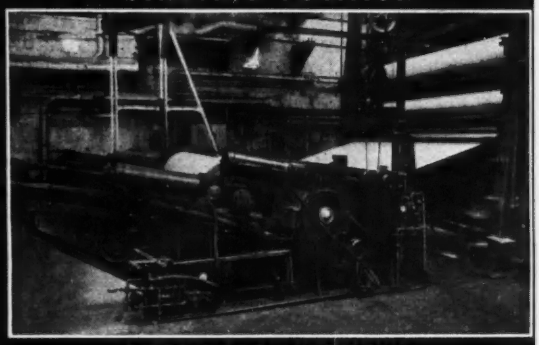
PATENTED



STARTING POSITION



FINAL WINDING POSITION



TRANSFER POSITION

DESIGNED FOR VERY HEAVY DUTY—TO WIND UP TO 78" DIAMETER ROLLS.

AIR PRESSURE, INDEPENDENTLY APPLIED TO FRONT AND BACK SIDES OF REEL SPOOL, MAINTAINS CORRECT WINDING CONDITION FOR GOOD ROLLS.

AIR PRESSURE CAN ALSO BE USED TO RELIEVE THE WEIGHT OF THE ROLL BEING WOUND.

NO BROKE WHEN CHANGING SPOOLS.

CAN BE INSTALLED ON PRESENT MACHINES.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS

BELOIT IRON WORKS

BELOIT
WISCONSIN

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending December 4, 1940

	High	Low	Last
A. P. W.	2¼	2¼	2¼
Armstrong Cork Co.	32⅜	31½	31⅝
Celotex Corp.	7⅛	6¾	7
Celotex Corp., pf.	69	66	68
Certain-Teed Products Corp.	5¼	4⅞	4⅞
Certain-Teed Products Corp., pf.	38¾	35½	36⅞
Champion Paper & Fibre Co.	20¾	20¼	20¼
Champion Paper & Fibre Co., pf.	104¼	104	104
Congoleum-Nairn Co.	18⅝	17½	17⅞
Container Corp. of America	15½	15¼	15¼
Continental-Diamond Fibre Co.	7¾	7¼	7½
Crown-Zellerbach Co.	15¾	15	15¼
Crown-Zellerbach Co., pf.	91½	90½	91
Flintkote Co.	16¾	16⅛	16¾
Robert Gair	2¾	2½	2¾
Robert Gair, pf.	15¾	15⅝	15⅝
International Paper & Power	17¼	16⅛	16⅝
International Paper & Power, pf.	71½	66¾	69⅝
Johns-Manville Corp.	62½	61	61
Johns-Manville Corp., pf.	125¼	125	125⅛
Kimberly Clark Corp.	38	37½	38
MacAndrews & Forbes	30	29½	29¾
MacAndrews & Forbes, pf.	132	132	132
Masonite Corp.	27	26⅜	27
Mead Corp.	9⅛	8¾	8¾
Mead Corp., pf.	65¼	65¼	65¼
Paraffine Companies, Inc.	....	....	....
Paraffine Companies, Inc., pf.	103	102½	103
Rayonier, Inc.	17⅝	17	17¼
Rayonier, Inc., pf.	28¾	28	28½
Ruberoid Co.	17¾	16⅝	17¾
Scott Paper Co.	38¾	36¾	38¾
Scott Paper Co., pf.	108½	108½	108½
Sutherland Paper Co.	23	23	23
Union Bag & Paper Corp.	13⅛	12¾	12⅞
United Paperboard Co.	3⅜	3½	3½
U. S. Gypsum Co.	71½	68¾	71½
U. S. Gypsum Co., pf.	175¼	175	175

New York Curb Exchange

High, Low and Last for Week Ending December 4, 1940

	High	Low	Last
American Box Board Co.	4¾	4¾	4¾
Brown Co., pf.	17	17	17
Great Northern Paper	42¼	42¼	42¼
Hummel-Ross Fibre Corp.	6¾	6⅜	6¾
National Container Corp.	11½	10¾	11¼
St. Regis Paper Co.	2¼	2⅛	2½
St. Regis Paper Co., pf.	82	78	82
Taggart Corp.	3¾	3¾	3¾

A. P. W. Paper Loses

[FROM OUR REGULAR CORRESPONDENT]

The A. P. W. Paper Company reports for July 1 through October 19 a net loss, of $16,507. No provision made in period for non-cumulative income interest on $761,706 par value of twenty-five-year 6 per cent convertible notes assented, nor for Federal income taxes, since no liability exists therefor, nor was provision included for additional contingent interest of 1 per cent on the first mortgage bonds, with warrants, on which maximum annual requirement is $11,340, payable only if earned. For corresponding period last year, company reported net profit of $21,085 after accrued interest on convertible notes but without provision for addition contingent interest on first mortgage bonds.

Great Lakes Paper Increases Dividend

TORONTO, Ont., December 2, 1940—Great Lakes Paper Company, Ltd., declared dividends of 50 cents each on class "A" and "B" preferred stock, payable December 31, as of record December 21. Arrears after this payment will amount to $8.25.

Previous payments this year were 25 cents on April 10, July 2 and Oct. 1, making total disbursements on each class $1.25 for the year, compared with $1 in 1939.

Crown-Zellerbach Nets $1.11

Consolidated net profit of the Crown-Zellerbach Corporation, paper manufacturer, and its subsidiaries amounted to $3,836,975 for the first half of its fiscal year, ended on October 31, according to the report issued on November 29.

The profit is equal, after preferred dividends, to $1.11 a share on 2,261,199 common shares and compares with $3,662,982 or $1.03 a common share for the like period a year ago.

Sales and operating profits before taxes for the six months' period established new records at $32,988,236 and $7,577,557, respectively, compared with $27,736,702 and $4,668,832 for the corresponding period last year. Provision for income and excess profits taxes increased $2,742,836 to $3,710,027 from $967,191 last year.

For the three months ended on October 31, the corporation had a consolidated net profit of $1,886,315 or 54 cents a common share. This compared with consolidated net profit of $1,950,660 for the preceding quarter, revised to give effect to United States excess profits tax and increase income taxes applicable to that period. For the October quarter last year consolidated net profit was $1,933,108 or 56 cents a share on common.

Abitibi Hearing Adjourned

TORONTO, Nov. 29, 1940—Hearing of an application by the Montreal Trust Company for a second public sale of the assets of the Abitibi Power and Paper Company was adjourned today sine die by Justice W. E. Middleton until after the results of a royal commission's inquiry into the affairs of the bankrupt company have been made known.

Union Bag Votes Dividend

Directors of Union Bag & Paper Corporation have declared a dividend of 45 cents per share on the common stock, payable December 14 to stockholders of record December 10. This brings total dividend payments for the year to $1 per share, two dividends of 15 cents each having been paid on April 5 and July 12, and one dividend of 25 cents on September 16.

B. C. Pulp Pays Interest

TORONTO, Ont., December 2, 1940—British Columbia Pulp and Paper Company, Ltd., payment of "B" first mortgage six per cent bond interest coupons, due May 1, 1939, to November 1, 1940, postponement of which payment to November 1, 1942, was authorized by bondholders last year, was made November 1, 1940, with interest at six per cent.

Southern Advance Nets $576,916

The Southern Advance Bag and Paper Company for the ten months to October 31, reports a net income, of $576,916, and net sales of $5,530,275.

Better Hot Melt Gloss Coatings at Lower Cost are made with

R·C·I *Synthetic* RESINS

Synthetic resins, substituted for lacquer, allow savings up to ⅓ on materials and produce better results on the finished job of hot melt gloss coatings.

Other uses for RCI synthetic resins in the paper industry include: clearer, paler overprint varnishes and lacquers and more efficient heat seal and wax coatings.

Inquiries concerning the use of Reichhold's complete line of synthetic resins are welcome.

REICHHOLD CHEMICALS

INCORPORATED • DETROIT • MICHIGAN

CONSTRUCTION NEWS

Middletown, Ohio—The Sorg Paper Company, manufacturer of bond, book and other paper stocks, has approved plans for one-story addition, to be used primarily for storage and distribution. Cost reported close to $40,000, with equipment. Erection contract has been awarded to Martin L. Bauer, Manchester road, Middletown, and work will be placed under way at early date. Pretzinger & Pretzinger, Reibold Building, Dayton, Ohio, are architects. It is understood that new structure will replace a building at mill recently destroyed by fire.

Philadelphia, Pa.—The National Decalcomania Corporation, 236 North 60th street, manufacturer of processed paper transfers, etc., has completed plans for three new one-story additions to plant, about 25 x 60 feet, 25 x 56 feet, and 15 x 25 feet, respectively, reported to cost close to $50,000, with equipment. Bids have been asked on general erection contract and award will be made soon. F. S. Elliott is company engineer, in charge.

Park Falls, Wis.—The Flambeau Paper Company, manufacturer of manila and other paper stocks, has begun superstructure for new one-story and basement addition to mill, recently referred to in these columns. It will be used for expansion in digester department. No estimate of cost has been announced. C. R. Meyer & Sons Company, 50 State street, Oshkosh, Wis., has the general erection contract. Company also has made an award to the same contractor for a new steel bulkhead at mill, for which sheet piling will be furnished by the L. B. Foster Company, Pittsburgh, Pa. Work on latter structure will be placed in progress at early date.

Mankato, Minn.—The Paper Service Company, commercial paper products, is considering the early rebuilding of two-story storage and distributing plant on South Front street, recently destroyed by fire. Loss reported at close to $50,000.

Chicago, Ill.—The Mackey Containers Corporation, 545 West Roosevelt road, recently organized with capital of $20,000, plans early operation of a local plant for the manufacture of a line of paper boxes and containers. The new company is headed by A. C. Mackey, one of the incorporators. It is represented by Freeman & Freeman, 1 North LaSalle street, Chicago, attorneys.

Buffalo, N. Y.—The National Gypsum Company, 190 Delaware avenue, manufacturer of wall board, insulating board and kindred products, is operating its wall board mills on a maximum production schedule, and will continue on that basis for an indefinite period. Company is stated to be considering a preliminary construction budget for 1941 at different plants, to include the installation of additional equipment where required for increase in present capacity.

Baltimore, Md.—The Hinde & Dauch Paper Company, Sandusky, Ohio, manufacturer of corrugated boxes and containers, has plans maturing for proposed new addition to branch plant at 3400 East Biddle street, Baltimore, previously referred to in these columns. It will be one-story, about 32 x 160 feet, reported to cost over $30,000, with equipment.

Amcelle, Md.—The Celanese Corporation of America, Inc., 180 Madison avenue, New York, N. Y., manufacturer of cellulose rayon products, has plans nearing completion for new addition to main mill at Amcelle, near Cumberland, for increase in production department. It will be two-story, about 120 x 125 feet, reported to cost close to $250,000, with equipment. Erection contract is scheduled to be awarded at early date. Company now has work under way on another addition to this same mill, recently noted in these columns, consisting of a three-story and basement structure, 100 x 400 feet, to be used primarily for expansion in storage and distribution department. It is estimated to cost approximately $200,000, with equipment. The George F. Hazlewood Company, Cumberland, has the erection contract for the last mentioned structure.

Brevard, N. C.—The Ecusta Paper Corporation, manufacturer of cigarette papers, has superstructure under way for new one-story building for general service, forming part of expansion program at mill, previously referred to in these columns, and has awarded a number of sub-contracts for completion of the structure. It will be used for the employes' division, with cafeteria and recreation facilities. Roofing and sheet metal work will be carried out by the J. A. Piper Roofing Company, 116 West Court street, Greenville, S. C.; steel sash is being furnished by the William Bayley Company, Greenville. New structure is reported to cost over $60,000, with equipment. The Fiske-Carter Construction Company, Greenville, has the general erection contract for this structure, as well as for other new additions to be added to the mill for large increase in present capacity. A total investment of approximately $2,000,000 will be made in new mill units and equipment. Completion is scheduled next spring. J. E. Sirrine & Company, Greenville, are consulting engineers.

Bridgeville, Pa.—The American Cyanamid and Chemical Corporation, 30 Rockefeller Plaza, New York, N. Y., manufacturer of papermaker's chemicals, etc., has approved plans for new one-story building at branch plant at Bridgeville, to replace a portion of the works destroyed by an explosion a few weeks ago. New unit will be about 145 x 600 feet, and is reported to cost over $300,000, with equipment. Erection contract has been let to the Martin & Nettrour Contracting Company, Diamond Building, Pittsburgh, Pa., and work will be placed in progress at once.

Grand Mere, Que.—The Shawinigan Water and Power Company, Montreal, Que., plans extensions and improvements in Laurentide hydroelectric generating station at Grand Mere, for increased power supply to paper mills and other industries in that area. Work will be placed under way soon and is reported to cost close to $100,000, with equipment.

Montreal, Que.—The Premier Paper Box Company, Ltd., 7 River street, Verdun district, manufacturer of paper boxes and containers, has begun erection of new one-story and basement plant on Mile End street, about 70 x 300 feet, reported to cost over $100,000, with equipment.

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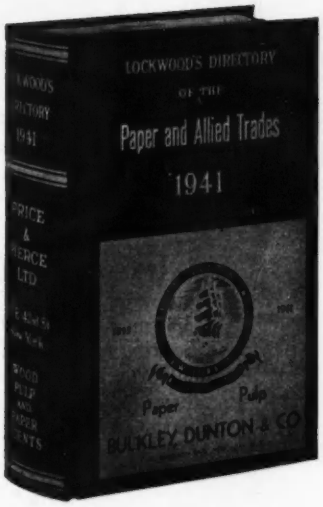

Ready for Distribution

LOCKWOOD'S DIRECTORY OF THE PAPER AND ALLIED TRADES

1941 - 66th Annual Edition - 1941

Published By

LOCKWOOD TRADE JOURNAL COMPANY, Inc.

15 WEST 47th STREET **Phone Number — BRyant 9-0860** **NEW YORK**

PAPER AND PULP MILL SECTION

Geographically arranged by states

Reports of the paper, ground wood pulp and chemical fibre mills located in the United States, Canada, Cuba, and Mexico. Also the Glazed, Coated Paper and Board Manufacturers.

These reports include name of company. Location of mill. Names of officers and their connections and operating executives.

It is indicated whether the plant is a paper mill, ground wood mill, sulphite, sulphate, or a soda pulp mill.

Type of mill equipment. Kind of power used, whether water, steam or electricity.

KIND OF PULP AND PAPER manufactured. Total production in pounds per 24 hours.

Shipping point, railroad siding, post office, nearest bank, money order and telegraph office. Population.

MILL OFFICIALS—Separate list alphabetically arranged.

MILL PRODUCTS—Classified—alphabetically arranged.

Reports of the Paper and Pulp Mills of South America and Trinidad.

ADDITIONAL MILL INFORMATION

CITY ADDRESSES—Mill or mill agent in some of the principal cities of the United States and Canada.

RAW MATERIALS—Classified and arranged in alphabetic order. The kinds and grade of paper stock and rags consumed by the different mills including names of the purchasing agents.

PAPER AND PULP MILL MACHINERY, EQUIPMENT AND SUPPLIES—*A classified (alphabetical) list of the different kinds of machinery, equipment and supplies used by the pulp and paper mills including the name and address of the manufacturers.*

CONVERTERS' SECTION

Manufacturers of Paper Specialties

A classified list (alphabetically arranged) of products made from paper, cardboard, etc., such as drinking cups, mailing tubes, napkins, toilet paper, towels, wrapping specialties, etc. This is an extensive list.
The name and address of the manufacturer is included.

Separate Lists of Concerns (Geographically arranged) manufacturing the following products.

ENVELOPES—Concerns manufacturing commercial envelopes.
PAPER BOXES—Keyed to show whether stiff, folding or corrugated boxes are made, also whether suit, millinery, confectionery, etc., etc.

PAPER BAGS	PREPARED ROOFING
TABLETS AND PADS	TWINE
TAGS	PAPETERIES

VEGETABLE PARCHMENT AND WAXED PAPER

ADDITIONAL SECTIONS

PAPER DEALERS—Geographically arranged and keyed to show the
**General Paper Dealers who maintain Stores.* †*Member National Paper Trade Association.* s *Dealers who sell from Storage, Warehouses or from Mill direct.* sl *Merchants in other lines who carry paper as a side line.* b *Brokers.* br *Those Concerns that are Branches of Houses located elsewhere.* f *Fine Paper.* w *Wrapping Paper.* f.w. *Fine and Wrapping Papers.*

RAGS AND PAPER STOCK DEALERS—Keyed to show kind of stock handled. Importers are included.

WALL PAPER PRINTERS — PULP TESTING CHEMISTS
WOOD PULP IMPORTERS — TRADE ASSOCIATIONS

STATISTICAL INFORMATION

WATERMARKS AND BRANDS—*Alphabetical list of Watermarks and Brands used in the American Paper Trade. Names of owners are included. This list is restricted to papers of various kinds—converted products are not included.*

SPECIAL TRAVELER'S EDITION—A limited number of copies, pocket size, for use of traveling men, Mill Section only, including the reports of the Paper and Pulp Mills, the Coating Mills, the list of Mill Officials and index to the Mills. These copies are bound in thin fabrikoid leather covers. Price $7.50, including delivery charges. ($7.00 cash with order.)

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New Books

THE MERCK INDEX: Fifth ed., Merck & Co. Inc., Rahway, N. J.: An encyclopedia for the chemist, pharmacist, etc. containing useful scientific data and other information on the physical, chemical and medicinal properties, as well as the various uses, of chemicals and drugs, tests and reagents, formulas for preparing culture media, fixatives and staining solutions, useful tables, antidotes for poisons, indicators. Price $3.00, 1060 pages.

KINGZETT'S CHEMICAL ENCYCLOPAEDIA: Sixth ed., Van Nostrand Company, Inc., New York, N. Y., revised and edited by Ralph K. Strong, professor of chemical engineering and chemistry, Rose Polytechnic Institute: This book gives in clear and concise form the essential facts about each term confronting the chemist about chemicals, industrial processes, products, reactions and engineering methods. The terms are arranged in alphabetical order with a complete set of cross references and other aids, including charts. In addition to sections on chemical engineering and industrial chemistry there is information on bacteria, chemical economics, common and trade names and numerous bibliographies and references. Price $14.00, 1088 pages, 6 x 9, cloth, illustrated.

APPLICATIONS OF CHEMICAL ENGINEERING: Edited by Harry McCormack, professor of chemical engineering, Armour Institute of Technology, and others. D. Van Nostrand Company, New York, N. Y.: Eleven chapters dealing with 32 fundamental topics and containing over 72 specific applications, covering in detail the broadest range of chemical engineering knowledge. The basic chapters, each written by an authority, cover the measurement of temperature, the flow of fluids, the flow of heat, evaporation, drying, distillation, humidification, classification and concentration of solids, and size reduction. It is essentially a laboratory manual. Price $3.75, 431 pages, 6 x 9¼, cloth, illustrated.

PUBLIC SPEAKING FOR TECHNICAL MEN by S. M. Tucker of the Polytechnic Institute of Brooklyn: This is a practical book written especially for technical men, showing how their characteristic faults in speaking may be removed. In addition to dealing with platform technique and organization of material it gives help concerning the use of the blackboard, charts and exhibits; how to give a lecture with lantern slides; how to meet interruptions and answer questions. Professor Tucker has for several years given a series of lectures on public speaking before the American Society of Mechanical Engineers and has thereby greatly improved the quality of technical addresses given before that body. The problem of good presentations before TAPPI and other engineering organizations has long been noted. Too often excellent subjects have reached short of their objectives by inadequate technique on the part of speakers. Price $3.00, 379 pages, 5½ x 8.

All of the above mentioned books may be obtained through the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York, N. Y.

KALAMAZOO

TILE CHEST

Adapted for Use with Agi-flo Pump

The Shartle Agi-flo agitates and delivers the stock. The Kalamazoo Glazed Tile Chest gives you the advantages of low cost storage and the utmost in cleanliness.

More than 700 installations of Kalamazoo Glazed Tile Tanks now in use prove their unvarying dependability. For maximum efficiency plan to use a Kalamazoo Chest with your next Agi-flo, or any other type of agitator.

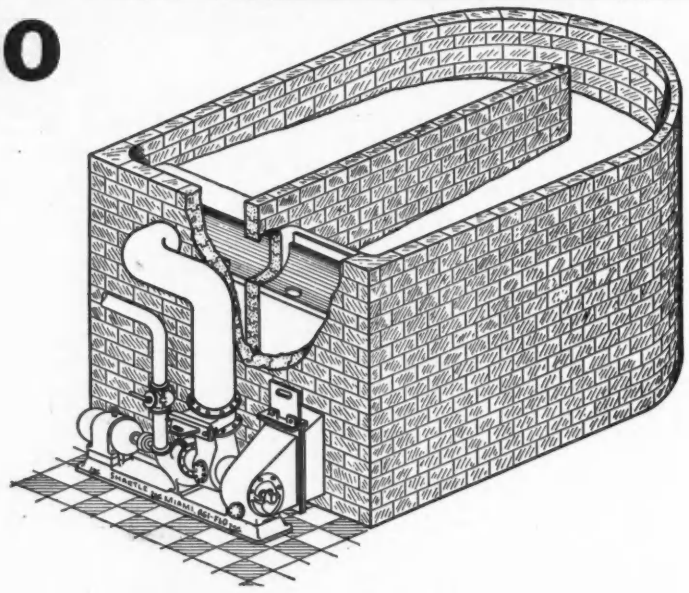


Illustration courtesy of Shartle Brothers Machine Company, manufacturers of the Shartle Agi-flo Pump.

GLAZED TILE

KALAMAZOO TANK & SILO CO.

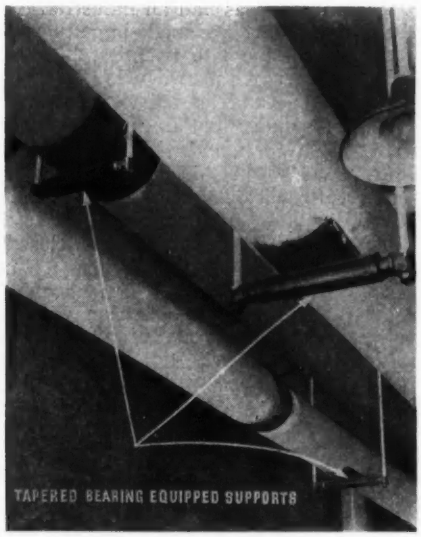
KALAMAZOO, MICHIGAN

WOOD

Tapered Roller Bearings Guard Against Extraneous Loads on Hot Water and Steam Lines

The American Viscose Corporation has installed tampered roller bearing conveyor tubes as supports for their hot water lines at their Front Royal, Va., plant. The steam line supports in another American Viscose Plant at Nitro, West Va., are also equipped with tapered roller bearings.

The bearing mounting consists of a conventional Timken conveyor tube, 8 inches long, equipped with Timken roller bearings and appropriate inner and outer seals at each end of the tube. Adjustment of the bearings is obtained through collars placed over the shaft and locked by means of two set screws. The bearings were packed at assembly with a light-to-medium consistency lime base grease.



TAPERED BEARING EQUIPPED SUPPORTS

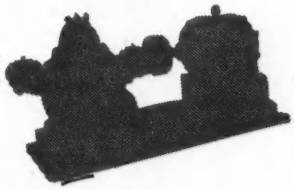
These are believed to be the first applications of this type. They provide positive assurance that line expansion will be properly handled. The ease of rolling afforded by the bearings permits the pipe expansion to take place with the minimum of effort and precludes any extraneous loads being put into the line as the expansion and contraction take place.

Speaks on American Forests

OGDENSBURG, N. Y., December 2, 1940 — An illustrated discussion of American forests was given here before business men this week by Ralph Unger, of the federal forest service, who declared that the future of the forests in Northern New York lies in their recreational value. At present there are more than 4,000 uses for timber and more than $40,000,000 is spent annually freighting lumber into the state, he said. The finest timber for production of paper is produced in the seven counties of this state, he said, and cited the case of the Algonquin Paper Company here. The forests are producing great revenue in this section annually from their recreational uses, he declared. Government conservation efforts were started in 1870, according to the forestry expert, and have grown yearly until now it is estimated that about 1,080,000 acres are under government care.

?

HOW TO KNOW WHEN TO REPLACE A PUMP . . .



What pumps in your mill have outlived their efficiencies and are causing excessive power consumption? Warren engineers can help you answer that important question. For they are trained through long experience to spot power-wasting pumps, to get and analyze the true facts on pump performance. Then, should power losses be uncovered, these engineers are equipped to recommend pump replacements on the basis of actual cost analyses . . . It's good business and sound engineering to check Warren on your pumping problems.

WARREN PUMPS

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WARREN STEAM PUMP COMPANY, WARREN, MASSACHUSETTS

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Pure Titanium Dioxide

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A brilliantly WHITE, pure, fine titanium dioxide possessing excellent . . .

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Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces *whiter* sheets of *great brilliance*, and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request.

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Howe Sound Mill to Resume

VANCOUVER, B. C., December 2, 1940—Port Mellon Operating Company has decided to resume production at its pulp mill on Howe Sound according to an announcement by representatives of F. W. Leadbetter, Portland, Oregon, president of the company. The plant has been idle for the past two years.

Machinery has been kept in good repair, and it is stated that the plant can resume operations with a minimum of delay.

Port Mellon Operating Company, formerly known as Vancouver Kraft, has had an industrial career of ups and downs. A start was made in getting the plant into production in the late twenties, but the stock market crash interrupted plans. In 1937 the plant was finally put in shape and started to produce, but the chief market for its output of unbleached sulphate pulp (kraft) was Japan, and when Japan became embroiled in the war with China, purchases of foreign pulp were greatly curtailed. Unable to obtain necessary credits, Japanese buyers abandoned the market, and Port Mellon Operating Company closed down after only a few months of operation.

Capacity of the mill is about 85 tons of sulphate pulp monthly. Its return to operation will give the province seven manufacturing units in the pulp and paper industry—the Powell River Company, Pacific Mills, B. C. Pulp and Paper (two mills), Westminster Paper Company, Sidney Roofing and Paper Company.

Idle Ravine Mill Reopens

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 2, 1940—What is known as the Ravine mill of the Fox River Paper Corporation, Appleton, Wis., was reopened today for production after having been idle since 1938. Between 60 and 70 additional employees have been hired.

The company's announcement declares: "The decision to reopen the Ravine mill derives from the high level of federal government buying, plus indications that general commercial business will improve very shortly. The addition of the Ravine mill's production facilities will put the company into much better condition to take advantage of increased business when the upturn materializes. Depending upon grade manufactured, its capacity will be from 4,500,000 to 7,700,000 pounds of rag content paper yearly.

"Several changes and improvements are planned in its equipment and facilities for the near future, to match the 2-year improvement program which has been carried on in the other three mills of the company."

The Ravine mill was closed in April, 1938, seven months before the property was acquired by the present corporation, headed by E. A. Oberweiser as president. Its reopening, by coincidence, falls on the second anniversary of acquirement of the property.

Carelon Paper Box Co. Chartered

Harrisburg, Pa., December 2, 1940—The State has granted a charter to the Carelon Paper Box Company, Inc., of Ephrata. The firm, capitalized at $50,000, was organized by John M. Baum, John L. Baum and Carrie E. Baum, all of Ephrata, to manufacture paper and paper products.

Sorg Announces Large Contract

J. A. Aull, president of the Sorg Paper Company, has announced that recently the company entered into a two-year contract with the Vancouver Kraft Corporation to purchase the entire production of the Port Mellon Mill, located twenty-five miles north of Vancouver, British Columbia.

The contract includes an option to buy the Port Mellon Mill together with the sawmill connected with it, at any time during the two-year period. This mill has an immediate capacity of 20,000 tons per year and is designed for an ultimate capacity of 40,000 tons per year. Only a few changes are required to reach the ultimate maximum capacity. For the time being, it will be operated at the 20,000 ton rate.

By this contract, the Sorg Paper Company, which for many years has been one of the leading manufacturers of kraft papers in the United States, is assured of an ample supply of best quality, northern, unbleached kraft pulp for conversion into various types of highgrade kraft papers, one of which is northern, specification kraft paper supplied to the Raymond Bag Company for the manufacture of multiwall bags.

Water Program at TAPPI Annual

Lewis B. Miller of the Keasbey & Mattison Company and Chairman of the Water Committee of the Technical Association of the Pulp and Paper Industry has announced an excellent program for the Water Session to be held during the annual meeting of the Technical Association on February 17-20, 1941 at the Roosevelt Hotel, New York, N. Y.

Rudolph Richter of the National Container Company and F. J. Lammers of the International Filter Company will discuss "Water Treatment as Practiced at the National Container mill in Jacksonville."

R. Tutt of the Peter Cooper Glue Company will relate experiences in "The Use of Sveen Glue and Its Effect on the Water in a Paper Mill."

A. R. Johnson of the Door Company will describe the operation of the Magnetite Filter plant at the Escanaba Paper Company mill.

Eskell Nordell of the Permutit Company will talk on "Conditioning Water With the Spaulding Precipitator".

L. B. Miller will discuss "Chemical Coagulants for Water Treatment."

The Water Committee is now preparing an interesting and valuable monograph on Process Water. This will be ready in 1941.

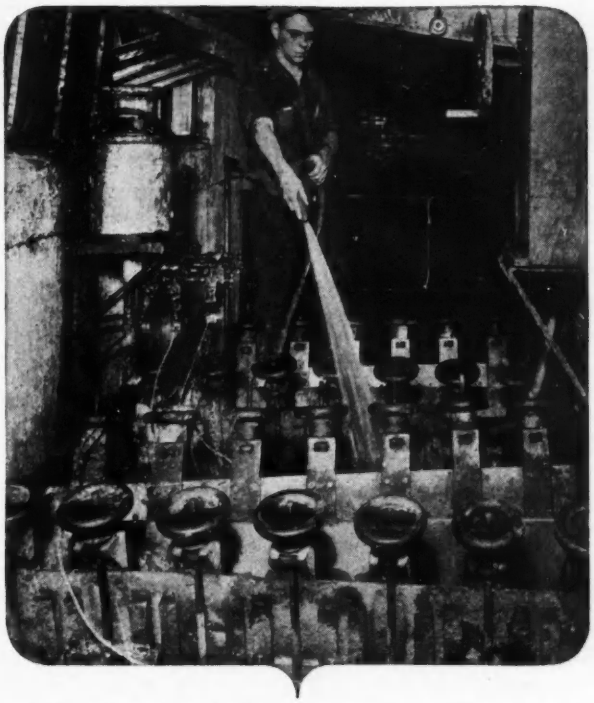
Purchases Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Dec. 4, 1940—During the week ended November 16, the Government purchased $137,840.96 worth of paper and allied products under the Walsh-Healey Act as follows: $16,579.46[1] worth of fiber boxes for Navy, Purchasing Office from Bird & Son, Inc., East Walpole, Mass.; $12,900.00 worth of toilet paper for Treasury Procurement from Ashland Paper Mills, Inc., Brooklyn, N. Y.; $22,440.00 worth paper towels for Treasury Procurement from Hanover Paper Corp., Brooklyn, N. Y.; and $85,921.50 worth of toilet paper for Navy, S&A, from Resolute Paper Products Corporation, New York.

[1] Estimated

Only 10 Minutes of This... AND IT'S CLEAN!



• When flow boxes in this paper mill were made of wood, clean-up crews washed and scrubbed for nearly an hour. Even so, in the words of the superintendent, "It was a half-done job. We never could get them really clean."

Now, with flow boxes made of ARMCO Stainless Steel, cleaning is a 10-minute job. Only a hose and water under pressure are needed. Scrubbing is out. What's more, this rustless metal is clean and smooth after every wash.

Result: Lower operating costs and better paper! Costly slime accumulation is greatly retarded by the always-smooth, hard surface of ARMCO Stainless. This means cleaner equipment, fewer weak spots and breaks in paper. And there's no rust to damage paper stock.

Let ARMCO Stainless Steels help you produce cleaner, more salable paper at lower cost. Just write us for complete data the next time you have an equipment problem. The American Rolling Mill Company, 2701 Curtis Street, Middletown, Ohio.

ARMCO

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STAINLESS STEELS

PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 111 December 5, 1940 No. 23

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

TAXES SETBACK EARNINGS

No more retroactive taxes on 1940 corporate and individual income for the present is the decision of the Treasury and Congress tax committees. This is encouraging but the increasing tax burden, a somewhat higher rate of depreciation, outlays for expansion, development and research, is expected to be reflected in a moderate setback in the profits of many concerns for the balance of the year. Although only a comparatively few reports of major concerns have as yet published reports for the nine-month period in which provision was made for the 1940 excess profit taxes, those doing so indicate that earnings are below expectations, although net profits are, of course, higher than in 1939.

In commenting on the 1940 excess profits tax, Godfrey N. Nelson, lawyer, tax expert and secretary of The New York Times Company, in a recent analysis in *The New York Times,* declares that the recently enacted levy is a compromise of principles. "The 1940 excess profits levy was enacted upon a compromise between the Senate and the House. Since its enactment, objections have been directed at some of its basic features; among these is the credit for average earnings of the base period years and the relief provisions which, by some officials, are considered to be too liberal to corporations. The fact of the matter is that no such excess profits tax could be made satisfactory because the mere requirement to file a return imposes a heavy burden upon the average corporation. The measure is suitable as an expedient, for war time only, when the government should be in a position to recapture excessive profits obtained from war activities. The structure of the tax is such that the revenue yield diminishes even upon a level of income unless credits are reduced and the rates advanced periodically. Inherently it is a tax on diminshing returns."

In pointing out that the excess profits tax contained in the "Second Revenue Act of 1940" lacks the required sustaining force, Mr. Nelson goes on to say that "Any general revision of the present levy should be made realistically and in the light of the Treasury's experience under the World War profits and excess profits taxes. That experience showed conclusively that this form of taxation operates efficiently only as a war measure and that it does not possess the qualities necessary for a sustained production of revenue. While the World War measures at first yielded comparatively large revenues, Treasury statistics prove that from 1919 to 1921, inclusive, with no change in the credits or the rates, and in spite of increased corporate gross income for 1920, the loss or revenue was so rapid that the indications were that if the tax had been retained for another year it would have yielded only a nominal amount of revenue."

From a tabulation of the varied rates Mr. Nelson makes the following observations: "Although the percentage of tax to net income for 1918 was twice that for 1917 (because of the substantially higher profits tax rates), the ratio of net income to gross income fell by 3 per cent, or approximately $2,367,000,000. While the volume of gross business for each of 1917 and 1918 was over $79,000,000,000, the net income dropped from $10,730,000,000 to $8,363,000,000. This indicates one of two things, or a combination of both: That business enterprise represented by the returns derived a lower rate of gross profit or that the cost of doing business increased. In either case, from a study of the tables, there is a presumption that a portion of the falling off was chargeable to the incidence of the tax."

In his analysis of the following years Mr. Nelson asserts that, "The figures for the years 1919, 1920 and 1921 (the tax rates remaining the same) show not only a continuance of the downward trend of net income to gross income, but that the yield of the tax on the reduced net income continued to diminish. Especially notable is the fact that, while 1920 shows an increase in the gross income over that of 1919 by $5,500,000,000, the net income for 1920 dropped by $1,500,000,000 and the war profits and excess profits tax dropped in greater proportion. For the year 1921, a depression year, gross income fell from nearly $94,000,000,000 to $60,000,000,000, and the excess profits tax, inclusive of the tax on government contracts at 1918 rates, also continued to fall. It may be argued that the post-war period should show diminishing business returns, but this does not explain the falling off of the rate of revenue from the tax."

In concluding his clear analysis of how a business recession is furthered by a tax on excess profits, Mr. Nelson said: "Unquestionably growing credits due to additions to invested capital of retained earnings contributed to the diminishing returns, but this is chargeable primarily to the nature of the tax. The

tables indicate that not only the net earnings but also the amount of tax revenue have a strange way of diminishing when the tax credits and tax rates remain unchanged. The first may be partially within the control of business management, but the second is inherent in the excess profits tax. The tax may be defended on the ground of expediency as a temporary measure, but any tax method which requires periodic rate increases in order to remain productive is not sound taxation."

Assessed for Sacandaga Reservoir

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., December 2, 1940—Prominent paper mills in this section will again provide the major portion of the sixteenth annual assessment for the post and operation of the Sacandaga Reservoir in Warren County. The levy calls for raising $85,524.45 for the cost and $12,134.60 for operation of the huge reservoir in that county. The reservoir was constructed at a cost of about $12,000,000 by the Hudson River Regulating Board and it has already proved to be a great obstacle in preventing floods which has saved a considerable amount for the state. Paper mills have also benefitted greatly by the increased water power available for manufacturing purposes and there are few shutdowns recorded during the drouth periods which formerly worked havoc in this section by causing long suspensions of operations.

In Warren County the next installment for cost is as follows: Town of Queensbury, Moreau Manufacturing Corporation, $786.49, International Paper Company, $54,897.14 and International Hydro-Electric Co., a similar amount; Glens Falls, Finch, Pruyn & Company, $20,606.09; Luzerne, International Hydro-Electric Company and International Paper Co. $1,245.28, New York Power and Light Corporation, $7,484.78, International Hydro-Electric Company, International Paper Company and Warren Curtis Manufacturing Company $504.57.

Operating costs are apportioned as follows: Glens Falls, Finch, Pruyn & Co. $2,672.40; Queensbury, Moreau Manufacturing Corporation, $102., International Hydro-Electric Company and International Paper Company, $7,119.60; Town of Luzerne, International Paper Company and International Hydro-Electric Company, $161.50, New York Power & Light Corporation, $970.70, International Hydro-Electric Company and International Paper Company, $1,042.95, International Hydro-Electric Company, International Paper Company and Warren Curtis Manufacturing Company, $65.45.

Swedish Pulp Index Unchanged

WASHINGTON, D. C., Dec. 4, 1940—According to estimates made by the Federation of Swedish Industries, general industrial production during the month of June did not change compared with the previous month. The general index in June stood at 107, according to a report from the office of the Assistant Trade Commissioner, Stockholm. Likewise, the index for the pulp and paper industry remained unchanged during June as compared with May, with the index standing at 51 for the pulp and paper industry.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.8%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	93.8%	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	87.1%	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	87.2%	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	83.3%	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	88.2%	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 47 weeks	87.9%	84.2%	72.0%	83.5%	80.9%	70.4%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
October 19	87.4%	October 21	98.6%
October 26	88.5%	October 28	97.9%
November 2	88.6%	November 4	98.0%
November 9	88.1%	November 11	98.1%
November 16	87.4%	November 18	98.4%
*November 23	87.4%	November 25	96.2%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Oct. 19, 1940	Oct. 26, 1940	Nov. 2, 1940	Nov. 9, 1940	Nov. 16, 1940	Nov. 23, 1940
0% to 50%	54	45	44	49	49	40
51% to 100%	239	249	247	240	221	205
Total Mills Reporting	293	294	291	289	270	245

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	79%	72%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	74%	72%	79%	....	....	....

Week end. Oct. 19, 1940—78%
Week end. Oct. 26, 1940—80%
Week end. Nov. 2, 1940—80%
Week end. Nov. 9, 1940—78%
Week end. Nov. 16, 1940—77%
Week end. Nov. 23, 1940—77%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Preliminary figure.

E. L. Small Retires at 70

E. L. Small, who has been chief engineer for the Fox River Paper Corporation, Appleton, Wis., for the last twenty years, has announced his retirement. He has reached the age of 70 years, and intends to follow his diversions of hunting and fishing.

Mr. Small came to the Fox River mill in August, 1920, leaving a possition with the American Writing Paper Company, Holyoke, Mass.

Soon after arriving in Appleton, he had the task of revamping the Telulah mill, which had been purchased from the Kimberly-Clark Corporation. There followed a series of major improvements which he supervised, including installation of new hydro-electric equipment with four water wheels, modernizing of No. 2 mill and installation of new beaters and washers, construction of a machine shop and filter plant, power dam and boiler house, and production changes in No. 3 mill.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Economic Problems In Logging and Timber Management*

By Axel J. F. Brandstrom[1]

Abstract

The problems incident to logging in the forests of the northwestern part of the United States are discussed from the economic point of view.

The Douglas fir region in the Pacific northwest embraces a territory 500 miles long and on the average about 100 miles wide, with a total land area of 35,000,000 acres. Nearly one third is covered with old growth virgin forests. Another third bears second growth forests varying from Christmas tree size to 160 year old stands of saw timber size. The remaining one third includes farms, pastures, town sites, barren mountain areas, burns, and nonrestocked cut over lands. More than 80% of the total is primarily forest land.

Within this forest region there is a total visible saw-timber supply of 520,000,000,000 feet, net log scale, representing 33% of the United States grand total. This is now being cut at the rate of about 8,000,000,000 feet per annum, which represents about 33% of the nation's total production.

Timber Supply

Contrast this with the fact that we have less than 2% of the country's population and you will readily appreciate the relative importance of the forests and the forest industries in the economy of the region. For a symbol of its basic resources we choose a tree. For a symbol of its industrial activities, we choose a sawmill, a plywood plant, or a pulp mill. About 60% of our industrial payroll comes from the forests and their dependent industries.

Not only do we have a large regional timber supply, but we have exceptionally large trees and large volumes per acre. Trees four to eight feet in diameter and over 200 feet in height are thus typical of large areas of the 300 to 800 year old virgin stands, though, generally, in such cases in mixture with smaller understory tree. Stand volumes averaging 50,000 feet and more per acre are found over entire townships, and individual acres bearing 200,000 or more are not rare.

In the plywood plants, the largest and choicest logs are peeled in long continuous sheets like paper coming off a roll of newsprint—logs with a deep layer of clear, finegrained, mellow wood. That's the cream of the crop. To the sawmills go many logs of a quality and size that other regions would envy. And to the pulpmills go large quantities of hemlock, spruce, and white fir, much of it to be made into high grade sulphite pulp.

Against these advantages as to quantity, size, and quality of our timber there are many handicaps and disadvantages which this region has to meet.

Logging

Most obvious and most important among these disadvantages is the geographical location of the region as a whole in relation to the principal consuming markets which most of the forest products have to reach. In this respect, our forests are on the wrong side of the continent. Forest products and particularly lumber are heavy and bulky and when they have to be shipped across or around a continent it takes high quality to stand the cost.

Contributing to this initial handicap are the physical difficulties of logging in this region. The easy logging near the shores of bays, inlets, and rivers was as a rule completed in the early days, and as the timber line receded increasing difficulties of terrain and distances were encountered. Long, steep, rocky, mountainous slopes, cut up by winding canyons, creeks and rivers, interspersed here and there with swamps, or soft creek bottoms, together with excessive rainfall, have added their share to the problem of extracting these massive logs out of a jungle of large stumps, heavy underbrush and centuries of accumulated debris. Up until the early thirties the loggers and machinery manufacturers met these problems by developing cable logging machinery of constantly increasing power and speed—first the ground lead, then the high lead, then the slackline and skidder and other forms of so-called skyline or cableway logging, with which logs of any size could be brought out, no matter where they were.

More recently the development of motor trucks, tractors, tractor-mounted donkeys and bulldozers have come into the picture and brought many radical changes in this constantly shifting scene. But, despite all these mechanical developments and despite a high degree of skill and ingenuity on the part of the log-

* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Olympic Hotel, Seattle, Wash., Aug. 20-23, 1940.

[1] Crown Zellerbach Corporation, Camas, Wash.

gers, the fact is that logging costs in this region, owing, to a large extent, to the physical problems involved, are as a rule, higher than in other regions.

Part of these high logging costs are due to high wages, in comparison with other regions. And, these high wages do not stop with the logging but apply also the the sawmill, plywood, and pulp and paper plants and as such, affect the realization values obtainable from the standing trees.

No other forest region pays as high a wage scale as is paid here. This has worked hardships on the industry in trying to meet competition from regions with a lower wage standard and has been a particularly serious matter in connection with imports of foreign pulp.

Still another economic handicap is the pressure for liquidation that constantly tends toward overproduction. About half of the timber in this region is privately owned. Up until 10 or 15 years ago, many private owners were willing to hold their timber, even though physically overmature or decadent, in the belief that they would profit from rising values. Today, these hopes are, in many cases, shattered and owners are anxious to liquidate—in many cases forced to do so—in order to meet annually recurring taxes, on a resource which yields no income until the harvest takes place.

Tree Values

These are the handicaps this region has to meet, handicaps that have their effect at one stage or another as we follow the value of our logs or finished forest products back to the standing tree. Trees that would have a high value if they were growing in other parts of the world may have little or no value out here. Studies of our stand values show that trees containing peeler logs or high grade sawmill logs have, as a rule, a rather high value; others only a moderate or negligible value, while still others can be logged only at a loss. The latter are, usually, referred to as a minus-value tree, and in the plus-value trees are found in varying degree, logs—usually the top logs—that fall into the minus-value class, too.

The proportion in which these minus-value elements occur, varies greatly from one locality to another and from one type of timber to another. In some cases, the quantities involved are relatively small. In other cases, they range from 20 to 40% of the total stand volume.

And, in still other cases, such as in many so-called two-story forests, they rise to 50, 60 or 70%. This is the situation as we find it in operable stands. We also have many unoperable stands—stands with no-plus value trees at all or with so small a percentage of plus-value that they cannot stand the cost of developing the area with roads.

Frequently, a relatively large proportion of the minus-value element consists of overmature trees that fall into the minus-value class on account of roughness or defect. As a rule, however, it is the smaller and thriftier trees or the suppressed, understory trees that fall into this class—partly because such trees are naturally of lower quality and partly because logging costs are higher for small logs than for large, and particularly so where large high powered steam donkeys, which are designed for efficient handling of large logs, are used for small logs, as well.

Cable Logging

This latter situation often can be remedied to quite an extent by substituting lighter and more flexible equipment. But, in the case of cable logging in stands containing logs of all sizes, this is not an easy thing to do.

Along this line, the Crown Zellerbach Corporation undertook, in 1930, to first remove the large- and medium-sized logs with the usual heavy machinery, leaving the small logs for removal with lighter and more suitable equipment. This relogging job was done in a most efficient manner, using tractor-mounted double-drum units and loading the logs from staked cars, in order to build up reasonably large carload volumes.

But, when the job had been done and the costs had been added up, they were found to be a good deal higher than the market value of the logs. In other words, the minus-value logs remained in the minus-value class despite the well planned and well-executed adaptations that had been made to fit the size of the logs.

In connection with the logging of small trees, the question is frequently asked as to just where the line between plus and minus trees should be drawn. This is a question that cannot be answered without special study or attention to each particular case. Conditions in this region are far too variable to assume that the answer that fits one case will also fit another.

Here we find in some cases, moneymaking operations under way in young second-growth stands, in which the trees removed range perhaps from 14 to 20 inches in diameter, while in other operations, money is lost in cutting trees in the 40- and 50-inch class. Frequently, too, we find operations that lose money on large mature or over mature trees but make money on piling, poles, and Christmas trees.

These latter cases arise through specially favorable locations, logging conditions or local market demands; or where market outlets are found for special products; or where the operator makes money by working his employes under a subnormal wage standard.

The existence then of a relatively large proportion of minus-value trees in our stands is a characteristic feature of this region, of the forests of this region. We have, in many cases, several times more volume per acre in this class of trees alone than many other regions have in their stands as a whole.

In clear cutting with high leads, slack lines or skidders, this element of the stand, except as portions of it may be unwittingly utilized at a loss, is usually destroyed because the trees that are not felled are here mowed down in the logging or killed in the subsequent slash fire; or blown down by the first severe winter storm.

Selective Cutting

Wherever the minus-value element consists of badly suppressed or deformed trees or of highly defective trees, intermingled with a lot of culls, this destruction is good riddance—something we should seek to accomplish, wherever we can. But in cases where the minus-value element consists of good thrifty trees or trees of any species, size or age, which, though of minus-value today, have good prospects of rising to the plus-value class in the future. It is a destruction we should seek to avoid, wherever

it is practicable to do so. These are conditions that are being encountered to an increasing extent as the logging operations move to higher elevations where the stands contain increasingly large proportions of pulp wood species.

It is in stands of this type that selective cutting most forcefully comes into the picture, as a practical means for saving potentially valuable timber that would otherwise be destroyed.

A couple of weeks ago, I visited an operation where selective cutting with tractors, drum units and donkeys began only a few years ago. On this operation, some 30 miles of railroad spurs are now lined with virtually unbroken walls of timber that probably no man-made forest, starting with bare land could hope to equal in less than a century or so. They are stands averaging about 40,000 feet per acre which were left after removal of probably about 95% of the present plus-values of the stand. About 600,000,000,000 feet of selective logged timber, which includes intermingled, unoperable areas that were not touched at all, now stands there with a permanent road system in place ready for recurring selective cuts as future conditions may warrent.

Had this area been clear cut in the usual manner, most of this timber would have been destroyed or in part, utilized at a loss. As matters now stand, the leaving of this timber represents a direct monetary saving to the operator and, in addition, a potential future value of huge proportions. These are things that should make everyone stop and ponder and examine his own situation in the light of the selective cutting methods that have been developed in recent years.

From this discussion, however, we should draw no generalized conclusion that selective cutting, which removes all or nearly all the plus-value timber is the solution of everybody's logging and timber management problem. There are many stands where cutting to this particular value standard would leave nothing but a few inferior or decadent trees. This kind of heavy selection often leaves the ground in less desirable condition than if the area had been logged clean. Examples of this type of cutting, can be observed along many of our highways and have given rise to considerable criticism of the logging methods used by the industry.

One fact that should be recognized is that in these heavy Pacific coast forests, with their comparatively low-value trees, logging is accompanied by a great deal of waste. Under clear cutting this waste sometimes reaches huge proportions. Severe criticism is frequently heard implying that the lumber industry should be forced to utilize some or all of this waste material. Such criticism often comes from people who have been in Europe, and found that over there practically the entire tree, no matter what size, is utilized.

This is particularly true of central Europe. There the portions of the tree that do not go to sawmills or plywood plants, etc. are cut into pulpwood; and the smallest tips are cut into fuel wood. And, after these operations are completed, the local peasants come into the forest and pick up the faggots which they carry home for fuel. This is complete utilization, rivaling the standards set by the meat packing industry of this country. But, if we begin to think in terms of European standards in forest utilization, we should also, I believe, give a little thought to their standards of utilization with respect to food and other agricultural products.

By this reference to our forest utilization problem, I do not imply that we should waste anything that has value. There is no present justification for thinking in terms of European standards of waste utilization. Closer utilization of our logging waste should come only to the extent that we find profitable use for it.

Printing Papers at TAPPI Annual

An interesting program has been arranged for makers and users of coated and printing papers at the Coating and Graphic Arts sessions of the annual meeting of the Technical Association of the Pulp and Paper Industry to be held at the Roosevelt Hotel, New York, N. Y. February 17-20, 1941.

In the Coating Session the following papers will be presented:

"The Internal Bonding Strength of Paper" by E. Sutermeister and H. W. Osgood, Jr., S. D. Warren Company.

"Performance of Machine Coated Papers and Scope of Their Application" by G. K. Dickerman, Consolidated Water Power and Paper Company.

"Requirements of Base Papers for Varnish Coatings" by Victor P. Ryan, Crown Cork and Seal Company.

"Opacity Variability as a Measure of Coated Raw Stock Performance" by F. H. Frost, S. D. Warren Company.

"Staybelite Resin" by J. H. Long and A. C. Dreshfield, Hercules Powder Company.

In the Graphic Arts Session the following papers will be presented:

"Inks and Their Relation to Paper" by George Cramer, Sinclair and Valentine Company.

"A Method of Conditioning Paper for Multi-Color Offset Printing" by C. G. Weber, National Bureau of Standards.

"Geodetic Survey Map and Chart Printing" by D. P. Barnet, U. S. Coast and Geodetic Survey.

"Tack Measurements for Printing Papers" by A. E. Gessler, Interchemical Corporation.

"Specific Surface Measurements of Fine Particles" by A. E. Gessler, Interchemical Corporation.

To Handle Caustic Soda, Chlorine, etc.

Sale of chemical products manufactured by the Pittsburgh Plate Glass Company will be handled in the future by the company's Columbia Chemical Division, it was announced this week. Previously, sale of such chemicals as soda ash, caustic soda, and chlorine, was conducted through the Columbia Alkali Corporation, a wholly owned sales division.

This action does not affect the personnel or sales organization. Customers will merely purchase direct from the Columbia Chemical Division of the Company rather than through a wholly owned sales corporation as they have in the past.

Eli Winkler, executive sales manager, and W. I. Galliher, director of sales, will retain their respective positions.

The status of existing contracts of The Columbia Alkali Corporation and existing distributor relationships will not be affected by the change.

The Ultraviolet Absorption Spectra of Lignin and Related Compounds*

By Ralph E. Glading[1]

Abstract

A study has been made of the absorption spectra of spruce native lignin, spruce native lignin derivatives, lignins isolated from sprucewood by compounds containing hydroxyl and sulphydryl groups, and related organic compounds.

For many of the lignins and derivatives, the absorption coefficient at 280 mμ was directly proportional to the native lignin content of the material. This relation did not hold for lignins or derivatives in which the nonlignin material present had a high absorption coefficient at 280 mμ nor did it hold for methanol lignins or lignins isolated from wood by an alkaline agent.

The calculated and the observed absorption spectrum curves of phenol native lignin and thiophenol lignin agreed fairly well. Absorption coefficients of the lignin derivatives were calculated by adding the absorption coeffcients of the weights of native lignin and of phenol or thiophenol present in one gram of the derivative.

A study of the absorption spectra of 2'-hydroxychalcone, flavanone, quercetin, native lignin, and demethylated acetylated Willstätter lignin showed that the absorption spectrum of native lignin could be explained by the assumption that each native lignin building unit contains two pyran rings such as are proposed by Freudenberg (22). These oxygen rings would be responsible for the very persistent absorption band of lignin at 281 mμ.

It was shown that the carbonyl group whch Brauns (12) had shown to be present in the native lignin building unit could be responsible for the band at 352 mμ in the absorption spectrum of the phenylhydrazone of native lignin and that the almost complete enolization of the carbonyl group could account for the nonappearance of this band in the spectrum of native lignin and other lignins.

Between 1927 and 1933, Herzog and Hillmer *(1, 7)* published a series of papers dealing with the ultraviolet absorption spectra of lignins. They determined the spectra of lignosulphonic acids, alkali lignins, and methyl, ethyl, and glycol lignins, and a number of simple organic compounds. They found a relationship between the plant source of the lignin and the wavelength of maximum absorption and a relationship between the intensity of absorption and the chemical nature of the derivatives. Both isoeugenol and coniferyl alcohol were polymerized to substances having absorption spectra similar to that of lignin. By a study of the spectra of simple aromatic compounds similar to those isolated as decomposition products of lignin, Herzog and Hillmer discovered certain relations between chemical structure and ultraviolet absorption spectra of this group of aromatic compounds. They concluded that their studies of the spectrum of lignin had shown that the basic unit of lignin is a di- or trihydroxyphenol, partly or wholly etherified, having a side chain of about three carbon atoms which contains no double bond or carbonyl group conjugated with the benzene ring.

In 1931, Hägglund and Klingstedt *(8)* pointed out that in the ultraviolet absorption spectra of lignins the principal absorption band of hardwood lignins occurs at shorter wavelengths than the corresponding band of softwood lignins and that the absorption band occurring at about 235 mμ is almost completely covered by the rapidly increasing general absorption and therefore is not easily recognized.

Rassow and Wagner *(9)* prepared pine glycol lignins. They found one pine glycol lignin which showed no absorption peak in the neighborhood of 280 mμ. It could be separated into a chloroform-soluble and a chloroform-insoluble fraction; each showed an absorption maximum at about 280 mμ. They postulated that the chloroform-soluble fraction, having the stronger absorption, was the enol form of the pine glycol lignin, and that the chloroform-insoluble fraction was the keto form. Absolute alcohol separated the pine glycol lignin into a soluble and an insoluble fraction; neither showed a maximum absorption around 280 mμ. Acetone also separated it into a soluble and an insoluble fraction; each showed identical absorption, with a peak at about 280 mμ.

Stamm, Semb, and Harris *(10)*, in a study of the absorption spectra of lignins, found that a thermal reaction product of cellulose, which was insoluble in 72% sulphuric acid and which had been shown to have other characteristic properties of lignin, gave an absorption band practically identical with that of lignin, except that the corresponding extinction coefficients were smaller.

Presentation of Problem

When a study of the absorption spectrum of lignin was being contemplated, it was recognized that the problem might be approached from two points of view. (a) The absorption spectrum of native lignin could be determined, and the effect of introducing substituents into the lignin could be established by comparing the spectrum of native lignin with those of its derivatives. Then, if simple organic compounds could be found which showed the same change of absorption spectrum with the same type of substitution, the manner in which the substituents entered the lignin molecule could be established. (b) If compounds could be synthesized which had structures similar to those proposed for lignin, their absorption spectra could be compared with that of lignin, and the evidence for or against certain proposed lignin structures would be strengthened.

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* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Olympic Hotel, Seattle, Wash., Aug. 20-23, 1940.

A portion of a thesis submitted in partial fulfillment of the requirement of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1940. This work was carried out under the guidance of F. E. Brauns and Philip Nolan.

[1] Member TAPPI, West Virginia Pulp and Paper Co., Luke, Md.

The problem was attacked by determining the absorption spectra of native lignin, its derivatives, and other lignins isolated directly from sprucewood. The ultraviolet absorption spectra of carefully purified organic compounds known to contain groups present in lignin or known to have structures similar to those proposed for lignin were also determined. Interpretation of these spectra then was undertaken according to the principles mentioned under *(a)* and *(b)* of the preceding paragraph.

Presentation of Data

Determination of Absorption Spectrum Curves

Apparatus. Absorption spectra of solutions were determined photographically, using a light source rich in ultraviolet light, a multistep sector photometer, cells for holding the solution and solvent, a quartz spectrograph, photographic plates, and suitable photographic processing equipment.

The light source consisted of an electric arc between two iron electrodes about 3 mm. apart. The arc operated off a 120-volt direct current line through a Bausch and Lomb arc resistor and drew 5 amperes.

A Bausch and Lomb medium quartz spectrograph was used for this investigation. The slit width was set at 0.15 mm.

Eastman 50 photographic plates, 4 by 10 inches, were used, which were developed about 5 mnutes in Eastman developer DK-50 at 68 deg. F., immersed in Eastman stop bath SB-3 for 2.5 minutes, and fixed in Eastman fixer F-5 for 20 minutes. They were then washed in running water for one hour and subsequently allowed to dry.

The multistep sector photometer (designed by J. A. Van den Akker) was attached to the spectrograph between the light source and the slit. The sector of this attachment made 2400 revolutions per minute, from which it may be calculated that the frequency of exposure was 40 per second. Such a frequency is satisfactory for a method of this sort, as is shown by Harrison (*11*) in a discussion of the validity of the use of a rotating sector before the slit of the spectrograph to reduce the average intensity of the light reaching the photographic plate, from which the following quotation is taken.

> Webb's results indicate that an intermittent exposure is equivalent photographically to a continuous exposure when the rate of flash is so great that each grain of the emulsion receives on the average not more than one quantum per flash. We realize now that the frequency of the flash is the critical variable which caused such lack of correlation among the results of previous workers. Webb showed that for each intensity, emulsion and wavelength a critical frequency of flash exists above which it is quite safe to use intermittent exposures as equivalent to continuous. The critical frequency for ordinary conditions is of the order of 10 flashes per second, but to be safe one should run the sector as rapidly as possible. The greatest reciprocity and intermittency failures occur when the quanta are small (infrared), or the emulsion grains are small (slow plates or papers), or the intensify high, but even under such conditions O'Brien and Parks showed that with sufficiently high sector speeds the method gives accurate results.

For the validity of the method, it is necessary to assume that the light source was nearly constant in intensity during the 1/40 second required for the sector to make one revolution, and the assumption is probably not untrue to any significant degree.

Two divided quartz cells, one providing a solution thickness of about one cm. and the other of about one mm., were used in this apparatus. One half of a cell was filled with a solution of the material whose absorption spectrum was to be determined and the other half was filled wth the solvent used in making up the solution. As in other methods of rotating sector photometry, all the light entering the slit of the spectrograph passed through either the layer of the solution being investigated or a layer of equal thickness of the solvent.

Method. Solutions of the carefully purified materials to be used for absorption spectrum determination were prepared in concentrations varying from 1 to 0.005 grams per liter. The solvents used were purified ethyl alcohol and a mixture of 90 parts by volume of purified dioxane and 10 parts of distilled water.

In making the absorption spectrum determinations, a thick cell, giving a solution thickness of about one cm., was used for alcohol solutions, and a thin cell, giving a solution thickness of about one mm., was used for the 90% dioxane solutions. The thick cell was more convenient to work with and therefore was used whenever possible. Alcohol, which has a low ultraviolet absorption, was sufficiently transparent in the ultraviolet region, even in layers one cm. thick, to permit the use of the thick cell. Dioxane, on the other hand, has a high ultraviolet absorption, and had to be used in thin layers if it was to pass any considerable quantity of ultraviolet light and, hence, the thin cell was used.

The proper cell was filled on one side with the solution to be investigated and on the other side with the solvent used in making the solution. The cell was placed in the cell holder, and the iron arc, previously alined on the optical axis of the spectrograph, was started. The motor operating the multistep sector attachment was started, and the shutter on the spectrograph was opened, exposing the photographic plate. Exposure times varied between 0.5 and 150 seconds.

The exposed photographic plate was processed as described above. The spectrogram on the processed plate consisted of 11 horizontal strips of spectrum of the light which passed through the solvent half of the cell, all properly adjusted in intensity by the step sector so that they represented 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, and 5% transmittance, respectively. Sandwiched between these strips appeared the strips of spectra caused by the light which has passed through the solution half of the cell. Inasmuch as all the light reaching the slit of the spectrograph had passed through the same quartz windows and the same thickness of solvent, the effect of the absorption of light by the quartz and by the solvent was automatically compensated for, and the resulting spectrum was dependent only on the solute. At whatever wavelength the density of the photographic plate in a "solvent" strip equaled the density in an adjacent "solution" strip, there the transmittance of the solute was equal to that per cent represented by the "solvent" strip.

These match points were picked out and marked with ink on the glass side of the photographic plate. The wavelengths at which these match points occurred were read by means of a specially constructed wavelength scale and recorded.

From the values for transmittance, thickness of the layer of solution through which the light passed, and concentration of the solution, values for $\log_{10} k$ were calculated according to the equation:

$$T = e^{-clk},$$

where T = transmittance of solution (as compared with solvent)
e = base of natural logarithms
c = concentration of solute in grams per liter
l = thickness of solution through which light passed, in cm.
and k = absorption coefficient of the solute.

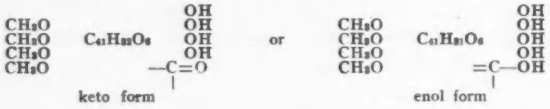
$Log_{10}k$ plotted against wavelength gave the absorption curve of the solute.

In the visible range, the General Electric recording spectrophotometer was used to determine transmittance.

Preparation and Purification of Compounds. The compounds whose spectra were to be determined either were commercial preparations, purified by crystallization or distillation to a constant absorption spectrum, or were synthesized according to the methods described in the literature and purified to a constant absorption spectrum. The lignins were prepared and purified according to methods described in the literature, and were used without further purification.

Discussion of Data

In 1939 Brauns (*12*) reported the isolation of native lignin and the preparation of several of its derivatives. A study of the chemical behavior of these lignins led to the conclusion that the native lignin building unit has the formula:



with a molecular weight of about 840. The molecular weight of the native lignin building unit, calculated from the methoxyl content of native lignin and based on four methoxyl groups per unit, is 838.3, which is in good agreement with the proposed formula. Brauns also presented formulas and the corresponding molecular weights for the derivatives of native lignin which he prepared.

The absorption spectra of almost all the lignins studied, Figs. 1 to 5, show an absorption band at about 280 mμ. This band persists in spite of such alterations in the lignin molecule as are caused by methylation, acetylation, or treatment with phenol, glycol, thioglycolic acid, sodium hydroxide, or sodium hydrogen sulphide. This fact suggests that the band at about 280 mμ is due to some configuration of atoms in the lignin molecule which is not disturbed by ordinary substitution reactions and which, in its absorption of radiant energy, is not influenced by the state or action of other portions of the molecule.

If equal weights of native lignin and a substance having no appreciable absorption at 280 mμ were mixed and the absorption spectrum of the mixture were determined, the absorption coefficient of one gram of mixture per liter of solution would be just half of the absorption coefficient of one gram of native lignin per liter of solution (assuming the validity of Beer's law). Or, if the absorption coefficient at 280 mμ of one gram per liter of a mixture containing x% native lignin and (100 — x) % material having no appreciable absorption at 280 mμ be known, then x would be equal to 100 times the ratio of the absorption coefficient of the mixture at 280 mμ to the absorption coefficient of native lignin at 280 mμ. Similarly, the introduction of a substituent which absorbs no significant amount of light at 280 mμ into the native lignin molecule would be expected to reduce the absorption coefficient at 280 mμ, and the ratio of the absorption coefficient of substituted native lignin to the absorption coefficient of native lignin should be equal to the ratio of the molecular weight of native lignin to the molecular weight of the substituted native lignin.

The correlation of the absorption coefficient of one gram of solute per liter of solution, k, at 280 mμ with native lignin content (ratio of the molecular weight of native lignin to the molecular weight of the lignin derivative) is shown in Table I.

TABLE I.—CORRELATION BETWEEN ABSORPTION COEFFICIENTS AND NATIVE LIGNIN CONTENTS OF LIGNINS AND DERIVATIVES

Lignin	Molecular Weight	(a) Native Lignin %	$Log_{10}k$ 280 mμ	(b) k at 280 mμ	(c) 100(b) / (a)
Native Lignin (N.L.)	838.3 [a]	100.0	1.62	41.7	41.7
N.L. methylated with CH_2N_2	866.3 [a]	96.9	1.59	38.9	40.1
N.L. methylated with CH_2N_2 and Me_2SO_4 + NaOH	908.3 [a]	92.4	1.59	38.9	42.1
N.L. methylated with CH_2N_2 and MeOH — HCl	898.3 [a]	93.5	1.58	38.0	40.6
N.L. methylated with CH_2N_2 and acetylated	992.3 [a]	84.6	1.51	32.4	38.1
Methanol N.L.	884.3 [a]	95.0	1.65	44.7	47.0
Methanol N.L. methylated with CH_2N_2	898.3 [a]	93.5	1.59	38.9	41.6
Methanol N.L. acetylated	1052.3 [a]	79.7	1.51	32.4	40.6
Acetylated N.L.	1048.3 [a]	80.1	1.50	31.6	39.4
Phenol N.L.	.....	77.7 [b]	1.62	41.7	53.7
Thioglycolic acid N.L.	1206.3 [c]	69.6	1.48	30.2	43.4
Phenylhydrazone of N.L.	928.3 [a]	90.4	1.69	49.0	54.2
Methanol lignin	884.3 [d]	95.0	1.73	53.7	56.5
Glycol lignin	881.3 [e]	95.1	1.59	38.9	40.9
Glycol lignin tritylated I	1067.2 [f]	78.6	1.53	33.9	43.1
Glycol lignin tritylated II	1552.3 [g]	54.0	1.42	26.3	48.7
Acetoxy-Hg compound of fully methylated glycol lignin	2279.6 [h]	36.9	1.37	23.4	63.4
Thiophenol lignin	.....	72.3 [i]	1.61	40.7	56.5
Thiolignin	872.3 [j]	96.3	1.78	60.3	62.6
Alkali lignin, Et_2O—insoluble	..... [k]	...	1.76	57.5	...
Phenol compound of Et_2O—insoluble alkali lignin	..... [k]	...	1.70	50.1	...
Phenol Willstätter lignin	.....	83.1 [m]	1.64	43.7	52.6

a. Molecular weights given by Brauns (*12*).

b. The native lignin content is equal to the ratio of the methoxyl contents of phenol native lignin and native lignin (11.5:14.8) (*12*).

c. Ahlm and Brauns (*13*) found that four thioglycolic acid groups enter the lignin building unit without splitting out water to form thioglycolic acid lignin, although the lignin building unit proposed by them differed somewhat from that proposed by Brauns (*12*). Inasmuch as the methoxyl content of thioglycolic acid native lignin agreed with that expected if four thioglycolic acid units entered the native lignin building unit of Brauns, the molecular weight of thioglycolic acid native lignin was calculated by adding the molecular weight of four thioglycolic acid molecules to the melecular weight of native lignin.

d. The formula proposed by Brauns and Hibbert (*14*) and the methoxyl content agree with methanol native lignin (19), hence the same molecular weight is assumed.

e. Gray, King, Brauns, and Hibbert (*15*) found that one glycol molecule enters each lignin building unit by ether formation. Although their building unit does not quite agree with the native lignin building unit, the molecular weight of the glycol lignin was calculated by adding the molecular weight of glycol to the molecular weight of the native lignin building unit and subtracting the molecular weight of water.

f. Because no formula was proposed for this compound, its molecular weight was calculated by multiplying the molecular weight of glycol lignin by the ratio of the methoxyl contents of glycol lignin and glycol lignin tritylated I (15.5:12.8) (*15*).

g. The molecular weight of this compound was calculated by multiplying the molecular weight of glycol lignin by the ratio of the methoxyl contents of glycol lignin and glycol lignin tritylated II (15.5:8.8) (*15*).

h. This molecular weight was taken from Gray, Brauns, and Hibbert (*16*). Their formula is consistent with Brauns' (*12*) native lignin building unit formula.

i. Thiophenol lignin has a methoxyl content of 10.7%. Its native lignin content may be calculated from the ratio of methoxyl contents of thiophenol lignin (*17*) and native lignin (*12*) (10.7:14.8).

j. According to Ahlm (*18*), hydrogen sulphide has entered the lignin building unit, so that the molecular weight is calculated by adding the molecular weight of hydrogen sulphide to the molecular weight of native lignin.

k. The formula proposed by Marshall, Brauns, and Hibbert (*19*) for alkali lignin and the phenol compound of alkali lignin is not compatible with the native lignin formula, and therefore, their molecular weights and percentages of native lignin would have no meaning.

m. The native lignin content is equal to the ratio of the methoxyl contents of phenol Willstätter lignin (*20*) and native lignin (*12*) (12.3:14.8).

The values listed in Column c of Table I are fairly constant except for some values which are obviously high. These high values could be due to either some change in the structure of the molecule which enabled that group responsible for the absorption band at 280 mμ to absorb more strongly or the presence of a substituent which also had a relatively high absorp-

tion coefficient at 280 mμ. In the case of phenol native lignin, phenol Willstätter lignin, thiophenol lignin, and the phenylhydrazone of native lignin, it is known that the added substituent has a high absorption coefficient at 280 mμ (*see* Fig. 6). The high values for methanol native lignin and methanol lignin are puzzling, for methanol is fairly transparent to ultraviolet light. The high value for the acetoxy-mercury compound of fully methylated glycol lignin may be caused by the absorption of light by the acetoxy-mercury groups present, but no confirmatory data are available. The high value for thiolignin and, in fact, the high k values at 280 mμ for thiolignin, alkali lignin, and the phenol compound of alkali lignin are possibly due to changes in the lignin molecule brought about by the alkaline cooking conditions. Thus, with the exceptions just noted, it appears that the absorption coefficients at 280 mμ of the lignins studied are directly proportional to their native lignin contents.

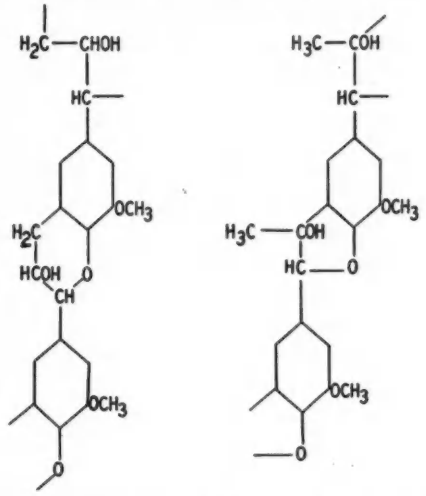
It has already been suggested that the absorption coefficient of a lignin derivative at a given wavelength might be calculated by adding the absorption coefficients of the amounts of native lignin and of the other material present in the derivative. This calculated absorption coefficient would be expected to agree with the observed absorption coefficient only when the chemical reaction between the lignin and the substituent had not destroyed the absorbing groups and when the mutual (physical) interaction of the substituent and the lignin in the derived molecule did not influence the light absorption at the wavelength under consideration. Inasmuch as the absorption spectra of phenol and thiophenol and their lignin derivatives are known (Figs. 2, 4, and 6), it is possible to calculate the expected absorption coefficients of phenol native lignin and thiophenol lignin. These coefficients are given in Table II, and the absorption spectrum curves based on these calculated coefficients are shown in Figs. 2 and 4. The native lignin contents given in Table I are used for calculating the composition of the lignin derivatives; they are as follows: phenol native lignin, 77.7% native lignin, 22.3% phenol; thiophenol lignin, 72.3% native lignin, 27.7% thiophenol.

The calculated absorption spectra of phenol native lignin and of thiophenol lignin, although leaving something to be desired in their degree of agreement with the spectra experimentally determined, do account for the persistence of the band at 280 mμ in phenol native lignin and for its disappearance in thiophenol lignin. Moreover, the belief is strengthened that even in those lignin derivatives where the absorption band at 280 mμ is not clearly in evidence, it is, nevertheless, there, and is merely masked by the absorption of some other part of the molecule. The trityl (triphenylmethyl) derivatives of glycol lignin also support this belief (*see* Fig. 3). The band at 280 mμ is less distinct in the trityl derivatives of glycol lignin than in glycol lignin itself. However, the absorption coefficients of triphenylmethane, triphenylcarbinol, and triphenylmethyl chloride all decrease markedly with increasing wavelength between 260 and 280 mμ *(21)* and this fact would account for the decreased sharpness of the lignin band at 280 mμ.

The question may now be asked, "What group or configuration of atoms is responsible for the lignin absorption band at 280 mμ?" It is the only clearly defined and persistent band which the lignin spectra show. It is not affected by ordinary substitutions in the lignin molecule and has been shown to persist in lignins separated from wood by alcohols (*8, 9*), alkaline pulping agents (*4, 8*), acid pulping agents (*1, 8*), and in chlorinated lignins (*10*). Demethylation of Willstätter lignin with acetyl iodide has produced a material which does not have any maximum in its absorption curve (*see* Fig. 5); this will be discussed later.

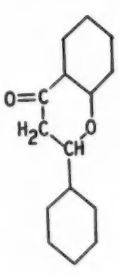
This question is really only a part of the more general question: "How can one account for the whole absorption spectrum of lignin—a sharply decreasing absorption coefficient between 220 and 260 mμ, a minimum absorption coefficient of about 1.45 at 261 mμ, an increasing absorption coefficient to the maximum, 1.63 at 281 mμ, and then a decreasing absorption coefficient toward longer wavelengths (*see* Fig. 1)?" One answer to this question would be supplied if simple organic compounds, having the same type of absorption spectra as lignin, could be found, especially if these compounds were similar to those groups known to be present in lignin.

Freudenberg (*22*) has proposed that lignin is a polymer of repeated C_6H_5-C-C-C units condensed in some such manner as the following:

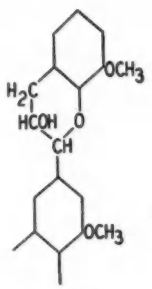


These formulas are the outgrowth of a vast amount of research into the chemical behavior of lignins and related compounds, and they are in very good agreement with much of the experimental data.

One of the compounds prepared and subjected to absorption spectrum determination was flavanone (*23*); the similarity of flavanone and a part of one of the lignin formulas proposed by Freudenberg can be seen from the following formulas:



Flavanone



Part of Freudenberg Lignin Formula

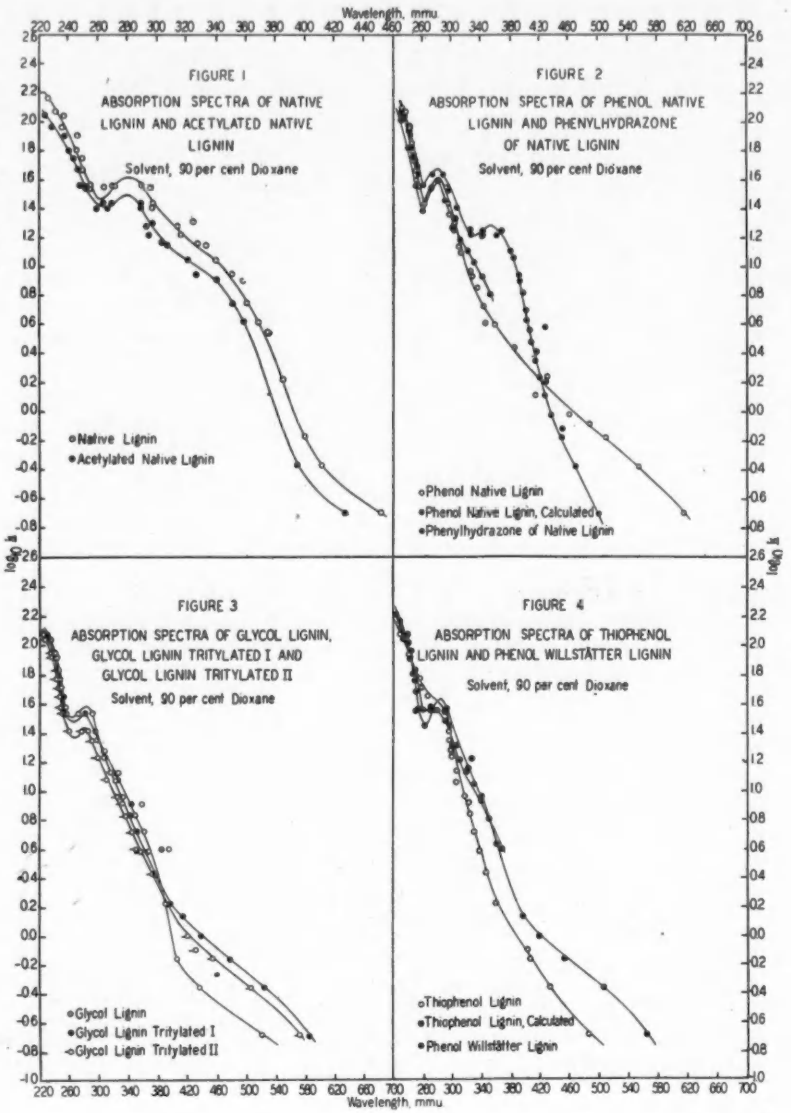


FIGURE 1
ABSORPTION SPECTRA OF NATIVE LIGNIN AND ACETYLATED NATIVE LIGNIN
Solvent, 90 per cent Dioxane
•Native Lignin
•Acetylated Native Lignin
FIGURE 2
ABSORPTION SPECTRA OF PHENOL NATIVE LIGNIN AND PHENYLHYDRAZONE OF NATIVE LIGNIN
Solvent, 90 per cent Dioxane
•Phenol Native Lignin
•Phenol Native Lignin, Calculated
•Phenylhydrazone of Native Lignin
FIGURE 3
ABSORPTION SPECTRA OF GLYCOL LIGNIN, GLYCOL LIGNIN TRITYLATED I AND GLYCOL LIGNIN TRITYLATED II
Solvent, 90 per cent Dioxane
•Glycol Lignin
•Glycol Lignin Tritylated I
•Glycol Lignin Tritylated II
FIGURE 4
ABSORPTION SPECTRA OF THIOPHENOL LIGNIN AND PHENOL WILLSTÄTTER LIGNIN
Solvent, 90 per cent Dioxane
•Thiophenol Lignin
•Thiophenol Lignin, Calculated
•Phenol Willstätter Lignin
Wavelength, mmu
log k

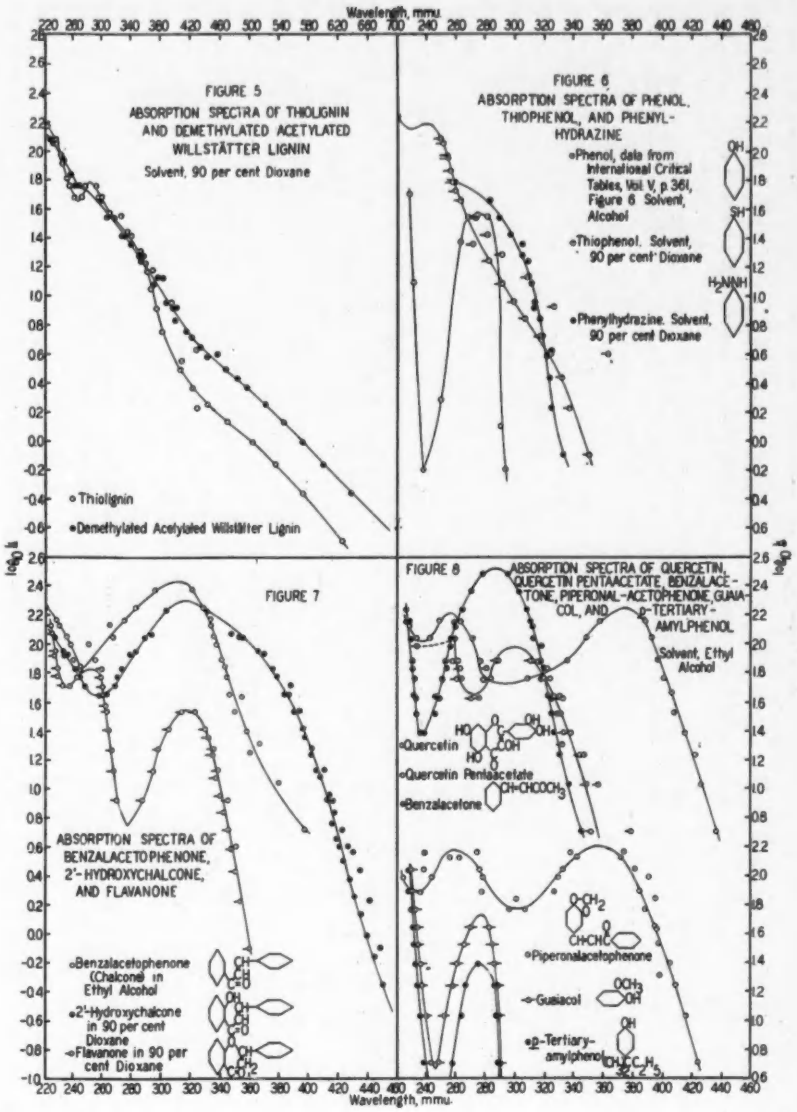


FIGURE 5
ABSORPTION SPECTRA OF THIOLIGNIN AND DEMETHYLATED ACETYLATED WILLSTÄTTER LIGNIN
Solvent, 90 per cent Dioxane
•Thiolignin
•Demethylated Acetylated Willstätter Lignin
FIGURE 6
ABSORPTION SPECTRA OF PHENOL, THIOPHENOL, AND PHENYLHYDRAZINE
•Phenol, data from International Critical Tables, Vol. V, p. 361, Figure 6 Solvent, Alcohol
•Thiophenol. Solvent, 90 per cent Dioxane
•Phenylhydrazine. Solvent, 90 per cent Dioxane
FIGURE 7
ABSORPTION SPECTRA OF BENZALACETOPHENONE, 2'-HYDROXYCHALCONE, AND FLAVANONE
•Benzalacetophenone (Chalcone) in Ethyl Alcohol
•2'-Hydroxychalcone in 90 per cent Dioxane
•Flavanone in 90 per cent Dioxane
FIGURE 8
ABSORPTION SPECTRA OF QUERCETIN, QUERCETIN PENTAACETATE, BENZALACETONE, PIPERONAL-ACETOPHENONE, GUAIACOL, AND p-TERTIARY-AMYLPHENOL
Solvent, Ethyl Alcohol
•Quercetin
•Quercetin Pentaacetate
•Benzalacetone
•Piperonalacetophenone
•Guaiacol
•p-Tertiary-amylphenol
Wavelength, mmu
log k

FIGS. 1, 2, 3, 4, 5, 6, 7, AND 8.

For Legends See Opposite Page

TABLE II.—CALCULATION OF ABSORPTION COEFFICIENTS OF PHENOL NATIVE LIGNIN AND THIOPHENOL LIGNIN

	Native Lignin				Phenol			Thiophenol			Phenol Native Lignin			Thiophenol Lignin		
μ	$\log_{10} k$	k	.777k (a)	.723k (b)	$\log_{10} k$	k	.223k (c)	$\log_{10} k$	k	.277k (d)	(a)+(c)= k calc.	$\log_{10} k$ calc.	$\log_{10} k$ ob.	(b)+(d)= k calc.	$\log_{10} k$ calc.	$\log_{10} k$ ob.
220	2.22	166.0	129.0	120.0	...	...	...	2.22	166.0	46.0	...	...	...	166.0	2.22	2.19
230	2.11	129.0	100.0	93.1	1.34	21.9	4.89	2.15	141.0	39.1	105.0	2.02	2.13	132.0	2.12	2.10
240	1.94	87.1	67.6	63.0	—0.19	0.65	0.14	2.18	151.0	41.8	67.7	1.83	2.00	105.0	2.02	1.98
250	1.67	46.8	36.4	33.8	0.27	1.86	0.41	2.07	117.0	32.4	36.8	1.57	1.67	66.2	1.82	1.86
260	1.46	28.8	22.4	20.8	1.11	12.9	2.88	1.73	53.7	14.9	25.3	1.40	1.45	35.7	1.55	1.74
270	1.56	36.3	28.2	26.2	1.54	34.7	7.74	1.52	33.1	9.18	35.9	1.55	1.54	35.4	1.55	1.67
280	1.62	41.7	32.4	30.2	1.54	34.7	7.74	1.33	21.4	5.93	40.1	1.60	1.62	36.1	1.56	1.61
290	1.56	36.3	28.2	26.2	0.21	1.62	0.37	1.13	13.5	3.74	28.6	1.46	1.57	29.9	1.48	1.54
300	1.39	24.6	19.1	17.8	—0.50	0.316	0.08	0.95	8.91	2.46	19.2	1.28	1.33	20.3	1.31	1.22
310	1.31	20.4	15.8	14.7	v.s.	v.s.	v.s.	0.79	6.16	1.71	15.8	1.20	1.15	16.4	1.21	1.00
320	1.23	17.0	13.2	12.3	v.s.	v.s.	v.s.	0.64	4.36	1.21	13.2	1.12	1.01	13.5	1.13	0.87
330	1.15	14.1	10.9	10.2	v.s.	v.s.	v.s.	0.44	2.76	0.77	10.9	1.04	0.90	11.0	1.04	0.72
340	1.05	11.2	8.70	8.09	v.s.	v.s.	v.s.	0.15	1.41	0.39	8.70	0.94	0.77	8.48	0.93	0.53
350	0.93	8.51	6.60	6.15	v.s.	v.s.	v.s.	—0.10	0.79	0.22	6.60	0.82	0.67	6.37	0.80	0.36

v.s.—very small. ob.—observed. calc.—calculated.

It will be noted that, except for the presence of two methoxyl groups in the lignin formula, the two differ principally in the appearance of an alpha-carbonyl group in flavanone and a beta-hydroxyl group in lignin. The effect of the beta-hydroxyl group in lignin on the absorption spectrum may be neglected, for Herzog and Hillmer *(6)* concluded that a beta-hydroxyl group in the side chain of a benzene ring had very little influence on the absorption spectrum.

What, then, is the absorption spectrum of flavanone? It is shown in Fig. 7. The shape of the curve between 225 and 260 mμ is very similar to that of the native lignin curve between 250 and 290 mμ (*see Fig.* 1). The flavanone spectrum shows another maximum at about 320 mμ, but this maximum is due to the chromophoric group consisting of an alpha-carbonyl group in a side chain of three or more carbon atoms on a benzene ring. The following compounds, containing this chromophoric group, have an absorption band between 300 and 400 mμ: 4-hydroxy-3-methoxypropiophenone (prepared by Friedel-Craft reaction between guaiacol and propionyl chloride), benzalacetophenone (*see* Fig. 7), piperonalacetophenone (*see* Fig. 8), quercetin (prepared by the hydrolysis of lemon flavine) (*see* Fig. 8), 2′-hydroxychalcone *(24)* (*see* Fig. 7), and flavanone (*see* Fig. 7). Moreover, it has been shown by Russell, Todd, and Wilson *(25)* that chalcone and hydroxychalcones, containing this chromophoric group and having a strong absorption band between 300 and 400 mμ, can be reduced by zinc dust and dilute acid in alcoholic solution *(26)* to bis-reduction products which no longer contain the carbonyl group and which do not have an absorption band in the 300 to 400 mμ range. Therefore, if flavanone should be reduced to flavan, by replacing the ketone-oxygen atom by two hydrogen atoms, the absorption band at 320 mμ in the spectrum of flavanone would be expected to disappear, and the resulting spectrum would be very similar to the spectrum of native lignin.

Description of Diagrams

(For diagrams see opposite page)

FIG. 1. Absorption Spectra of Native Lignin and Acetylated Native Lignin.

FIG. 2. Absorption Spectra of Phenol Native Lignin and Phenylhydrazone of Native Lignin.

FIG. 3. Absorption Spectra of Glycol Lignin, Glycol Lignin Tritylated I and Glycol Lignin Tritylated II.

Fig. 4. Absorption Spectra of Thiophenol Lignin and Phenol Willstätter Lignin.

FIG. 5. Absorption Spectra of Thiolognin and Demethylated Acetylated Willstätter Lignin.

FIG. 6. Absorption Spectra of Phenol, Thiophenol, and Phenylhydrazine.

FIG. 7. Absorption Spectra of Benzalacetophenone, 2′-Hydroxychalcone, and Flavanone.

FIG. 8. Absorption Spectra of Quercetin, Quercetin Pentaacetate, Benzalacetone, Piperonalacetophenone, Guaiacol, and *p*-Tertiaryamylphenol.

A comparison of the spectra of flavanone with that of 2′-hydroxychalcone (*see* Fig. 7), from which the flavanone was made by ring closure, shows that closure of the ring causes the appearance of the absorption band at 253 mμ and decreases the general absorption in the near-visible and visible regions. Conversely, opening the ring causes the disappearance of the band at 253 mμ and increases the near-visible and visible absorptions.

These latter effects are the very ones observed when lignin is treated with acetyl iodide, as may be seen by a comparison of the spectra of native lignin (*see* Fig. 1) and demethylated acetylated Willstätter lignin (*see* Fig. 5). It is known that acetyl iodide splits off methoxyl groups, because this reagent reduced the methoxyl content of the lignin from about 15 to 1.75%. It is quite likely that a reagent which breaks C-O-C ether linkages would also break the C-O-C linkage in the oxygen ring, assuming that such a ring exists in lignin. Thus, the changes in the absorption spectrum of lignin produced by acetyl iodide are consistent with the concept that lignin contains an oxygen ring similar to that in flavanone and that the oxygen ring is responsible for the characteristic absorption band of lignin at 280 mμ.

If the lignin absorption band at 280 mμ is due to a furan or a pyran ring, the persistence of the band in the lignins prepared in various ways and in lignin derivatives would be explained by the fact that the oxygen ring is unaffected by substitutions in the lignin molecule and is relatively insensitive to ordinary chemical agents.

But why does the band due to the oxygen ring appear at 253 mμ in the flavanone spectrum and at 280 mμ in the native lignin spectrum? The answer may be found in the work of Herzog and Hillmer *(3)*. They polymerized isoeugenol to the dimer and found that its whole absorption spectrum shifted about 15 mμ toward longer wavelengths. Likewise, the polymerization of flavanone to a compound having a molecular weight as great as lignin would be expected to shift the absorption spectrum curve toward longer wavelengths. Furthermore, it has been shown *(27)* that the absorption band at 247 mμ in the spectrum of flavone, corresponding to the band at 254 mμ in the spectrum of flavanone, can be shifted to longer wavelengths by the introduction of hydroxyl groups on certain positions of the benzene rings, as in the case of chrysin. A similar effect could account for at least a part of the difference in the wavelength of maximum absorption for flavanone and native lignin, for lignin is known to contain a number of free or etherified phenolic hydroxyl groups.

The difference in the absorption coefficients of flavanone at 253 mμ and native lignin at 281 mμ may be accounted for by the difference in their molecular weights and by the number of pyran rings in the native lignin building unit. On the assumption that the absorption coefficient of native lignin at 281 mμ is entirely due to the flavan structure, the relationship between the absorption coefficients may be expressed mathematically by the equation:

$$k_{N.L.} = n \frac{M_F}{M_{N.L.}} k_F,$$

where k = absorption coefficient
n = number of oxygen rings in native lignin building unit of molecular weight 840
M = molecular weight
and the subscripts N.L. and F refer to native lignin and flavanone, respectively.

Substituting the absorption coefficients determined experimentally in this equation gives the expression:

$$41.7 = n72.5 \frac{224}{840}, \text{ or}$$
$$n = 2.16.$$

Thus, the concept that the native lignin building unit contains two oxygen rings of the flavan or flavanone type is in good agreement with the absorption spectrum data.

The absorption spectrum of quercetin (*see* Fig. 8) shows the maximum at 257 mμ and the minimum at 238 mμ typical of the oxygen ring and the maximum at 376 due to the ketone group. The spectrum of quercetin, as compared with that of flavanone (*see* Fig. 7), is shifted toward longer wavelengths and toward larger absorption coefficients because of the appearance of the double bond in the oxygen ring of quercetin conjugated with both the adjacent benzene ring and the ketone group.

When hydroxyl groups appear on the benzene rings of chalcone, the absorption coefficients in the near-visible and visible regions become larger. This is established by comparing the absorption spectra of benzalacetophenone (chalcone) and 2′-hydroxychalcone (*see* Fig. 7). The same principle accounts for the high absorption coefficients of quercetin in the visible range. Inasmuch as lignin is known to contain phenolic hydroxyl groups and methylated phenolic hydroxyl groups, the relatively high absorption coefficients of lignin in the visible region are not surprising and are not inconsistent with the structure proposed by Freudenberg.

The absorption spectrum curve of the phenylhydrazone of native lignin (*see* Fig. 2) is peculiar in that a second maximum occurs at 352 mμ; this cannot be accounted for by addition of the absorption coefficients of native lignin and of phenylhydrazine, because the absorption coefficient of native lignin decreases rapidly with increasing wavelength between 330 and 380 mμ and the absorption coefficient of phenylhydrazine is so small as to be negligible in this range (*see* Figs. 1 and 6). However, the changes in the spectrum of acetophenone which accompany the formation of the phenylhydrazone may give some basis for interpreting the changes observed in the spectrum of native lignin. The absorption spectrum curve of acetophenone (*28*) has a maximum at about 330 mμ, and the absorption spectrum curve of the phenylhydrazone of acetophenone (*29*) has a maximum at about the same wavelength with an absorption coefficient of about 1.7 times the corresponding coefficient for acetophenone. No new band appears in the spectrum corresponding to the introduction of the phenylhydrazone residue; the main difference is the intensification of the band which is probably due to the carbonyl group. By analogy, the maximum at 352 mμ in the absorption curve of the phenylhydrazone of native lignin may be due to the intensification of an absorption band at the same wavelength in native lignin, a band which is so weak that it is completely covered by the general absorption in that region. This band is within the range in which the absorption band of a chromophore containing a ketone group similar to that in flavanone and quercetin would be expected and may indicate the presence of such a group in lignin. It is entirely possible that in native lignin the ketone group is highly enolized, and therefore there are too few carbonyl groups to produce a recognizable absorption band at 352 mμ. When the phenylhydrazone is formed, however, all the ketone groups are fixed in the ketone configuration, and there are enough of these groups to produce a definite absorption band. These concepts are in agreement with the observations of Brauns (*12*) on native lignin and its derivatives. The fact that the absorption spectrum curve of native lignin is not very different from the absorption spectrum curves of diazomethane-methylated native lignin, methanol native lignin, and acetylated native lignin (*see* Figs. 1 and 2) in the neighborhood of 350 mμ also indicates that in native lignin the ketone group is highly enolized, for, if it were not, its disappearance in the acetylated and methylated derivatives (*12*) should have produced noticeable changes in the absorption spectrum.

Attempts were made to explain the differences in the spectra of the various lignins and derivatives between 300 and 700 mμ, but, with the exception of the new band appearing in the spectrum of the phenylhydrazone of native lignin, the changes could not be interpreted on the basis of the present knowledge of lignin structure. However, certain observations may be recorded. The reaction of lignin with phenol, methyl alcohol, or alkaline pulping agents increases its absorption coefficients in the visible and near-visible regions. Diazomethane methylation of a lignin decreases the absorption coefficients in the neighborhood of 320 mμ. This phenomenon may be associated with the methylation of the phenolic hydroxyl group in the native lignin building unit, but confirming data on other compounds are lacking.

It should be pointed out that the explanations proposed in this discussion are merely those explanations which seem to be the most logical after consideration of the data available. It is entirely possible that the absorption spectrum of lignin can be explained on some other basis than the assumption of a flavan structure. Some such explanation was suggested by Herzog and Hillmer when they pointed out the similarity of the shapes of the lignin spectrum curve and the isoeugenol spectrum curve. This work has neither proved nor disproved the validity of such an explanation. Neither has it attempted to consider critically formulas proposed for lignin structure other than the Freudenberg proposals. It has shown, however, that the formula containing the pyran ring proposed by Freudenberg is consistent with the absorption spectrum data which are available and that the Brauns native lignin building unit, containing one easily enolizable carbonyl group, is consistent with the absorption spectra of lignin and its derivatives.

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Chipper Knives*

By Nels G. Johnson[1]

Abstract

A discussion of the factors affecting the life of chipper knives, such as setting the anvil knives improperly, bevels too short or too long causing overheating, and incorrect grinding which draws the temper during the grinding operation, is given. The benefits to be obtained from using the so-called high production type knives are described also.

With one or two possible exceptions, chipper knives are subjected to more sustained "punishment" than any other knife. Most of us, however, are so much more interested in the production from a tool than the tool itself that chipper knives, their care, grinding, etc., are very largely taken for granted. It is with the thought of reminding us all of some of the inherent qualities of chipper knives and their use—most of which are already known to us—that this paper is presented.

Chipper knives, generally speaking, are of three classes—laid carbon steel, solid carbon, and solid alloy, the latter being the high production type which has come in for considerable consideration in recent months.

When laid or solid carbon steel knives leave the factory, they are of maximum hardness for the particular mill intended. Of course, we all know that conditions in most mills vary—where a 60 Rockwell (C hardness) chipper knife will work satisfactorily one place, it's too hard for use in another mill. Fundamentally, however, overheating of chipper knives, regardless of original hardness, is detrimental to edge retention.

Let us assume that the carbon steel knives of which we speak are hardened to 60 Rockwell (C scale). Before these knives are ready for their final grinding operation, they are drawn by being placed in a drawing furnace at about 450 deg. F. for the purpose of removing all strain, setting the grain, and otherwise adding the essential property of toughness to the knife. Occasionally it is necessary to go slightly above or below 450 degrees, depending upon the particular requirement of the individual customer. In going considerably above 450 degrees, however, the hardness drops as the heat increases and the length of time the metal is subjected to that heat, so that while a knife becomes tougher with increased heat, it loses its hardness and becomes dull quicker.

Drawing Temperature

Now, suppose these knives are put in your chippers and kept running beyond the time that the knives should be changed—i.e., when the logs start "kicking back"—this condition will produce a heat beyond the original 450 degrees drawing temperature. In spite of the fact that this condition may exist for only a short period, it will tend to soften the temper, making it necessary to grind the knives more often with a consequent loss in production. A filing and Rockwell test of knives so used reveals that the hardness generally is below that which it should be for most efficient results.

Some mills use water as a coolant while chipping. This method of keeping knives cool is good if the water supply is generous and is directed so as to keep the entire knife cool as it cuts. If the water supply is insufficient, its contact with knives already heated can easily cause knives to crack, ultimately break out or check.

Now, there are many contributing factors in this battle of steel against heat, such as: (1) dull knives, (2) dull anvil knives or throat plates, (3) improper setting of anvil knives against disk, (4) blunt bevels, (5) lack of secondary bevels, (6) disk speed.

Most chipper knife disks now in use hold the knives in such a way that practically the entire face of the knife comes in contact with the wood. Broad contact generates considerable heat and tends to draw their temper. Some mills have found that a slightly concave knife face or clearance-ground knife relieves that condition.

A recent development in the chipper field particu-

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* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Olympic Hotel, Seattle, Wash., Aug. 20-23, 1940.

[1] Assistant General Sales Manager, Simonds Worden White Co., Dayton, Ohio.

larly in the east and south is the multiple knife chipper, using 8, 10, or 12 knives. The added knives make for faster cutting. Being mounted through the disk face so that only the cutting edges come in contact with the wood, the knives do not become hot enough to draw the temper.

Bed knives are sometimes overlooked owing to their being so "hard to get at" and practically impossible to see when in the machine. Some mills "hard-face" or Stellite their bed knives which is of great assistance in keeping them sharp, however, it is important to put this Stellite, or facing, on smoothly and free of blow holes. Improper grinding of these Stellite-faced anvil knives will cause them to chip and spall, bringing about a worse condition than if they were not hard-faced.

By improper setting of anvil knives with reference to the chipper disk, we mean that at times the distance between the bed knife and the cutting edge of the disk knives is too great, causing a wedging action between the wood, the anvil knife and disk knives, thereby causing undue strain, rounding of the anvil knife and excessive generation of heat.

Bevel of Knife

The bevel should always be as great as possible without sacrificing necessary support for the cutting edge. Softer or greener woods can be cut to good advantage with sharp bevels while shorter bevels are necessary on dry, hard, or frozen woods.

Secondary bevels are also the subject of much difference in opinion. Theoretically, the second bevel should make it possible to use a greater or keener cutting edge bevel by lending generous support to the knife where needed. It should also provide chip clearance, making it possible to get the chips away faster, all of which makes for better chips and less sawdust.

Disk speed is important for it determines the productivity of each chipper and where direct shaft motors are left at factory speeds or where belts are used that have no slippage, speed should not be much of a problem, however, a slow, dragging speed will generate as much excessive heat or more than a disk operating overspeed.

High Production Type

Let us make comparison now of the recently developed high production type of knife with which you are all familiar. These knives have inherent qualities which enable them, under favorable operating conditions, to retain their cutting edges infinitely longer than standard knives. These knives, while twice as expensive as standard knives, are worth the difference in price, provided operating conditions are satisfactory. Mills which have given these knives a fair test, report from three to ten times more service between grinds.

Generated heat of 450 degrees starts to draw the temper in standard knives but the higher alloy type retain their original hardness way above 600 degrees and for this reason are less affected by frictional heat. This means that they retain their edges longer.

The steel in the high production type of knife is of a dense structure. For this reason, overheating leaves little room for grain expansion as a consequence small checks are produced. We have stated before that the temper of these knives is not affected by temperatures from 450 to 650 deg. F., consequently, while in use, these knives remain sharp much longer, but being of a more dense structure, they are not, generally speaking, as tough; they are affected more by sudden temperature changes.

The same precautions apply in setting and beveling these high production knives as the standard knives. Care should be taken that the chipper knife pockets are entirely flat, free from any concaveness or convexness so that the knives will be well seated. In bolting these knives in the pockets, a strain is thrown into the knife as pressure is brought on by tightening the nuts and this strain is likely to start cracks if the knife is not flat.

The holding bolts should be properly fitted to the holes in the knife and the cheek plate angle should conform to the end angle of the knife where knives are so designed. Where shims are used, they should support the knife evenly over its entire length.

Some mills that have run the high production knife from 12 to 40 or more hours before removing for grinding have found it more profitable to change knives every eight hours and regrind them, regardless of condition. This makes it possible to regrind quickly, remove but little stock and cut more uniform chips with less sawdust.

Grinding

Since overheating seems to be the arch enemy of all chipper knife performance, it naturally follows that it should be kept at a minimum in grinding. Since the action of grinding does generate heat, great care should be exercised in selecting a grinding wheel, and in using it under conditions which will perform the job at hand as coolly as possible. A wheel should be selected which is on the soft side and this is particularly true of wheels for grinding the high production knives. By soft, we mean a wheel whose density and bond is in such proportion to amount and size of grain as to release each grain as soon as it becomes dull, thereby bringing up new sharp grains to continue the work of abrading. It is the dull grains which generate the heat, causing the steel to soften and adhere to the wheel; in other words, the dull grains are responsible for the loading of the wheel. Grains should not be so large that they cause too much friction in grinding, or weaken the cutting edge by leaving excessively deep grinding scratches in it, nor should it be so fine that the bevel is polished thereby generating more heat than necessary or desirable.

Wheels should be of aluminum oxide or refined aluminum oxide abrasive materials of grain sizes 36 to 60. Recommended bonds are vitrified, resinoid and silicate of soda.

In addition to care in the selection of the wheel, it is also important to use a coolant, such as water, or a neutral grinding solution, in such quantities and directed at the proper contact spot between the wheel and the work to keep the knife bevel cool. (Neutral coolant are recommended because highly alkaline solutions attack certain grinding wheel bonds such as resinoid.) In sufficient coolant supply is really worse than none at all.

In conclusion, it is well to remember that grinding wheels cost much less than knives, and that it is good economy to invest in a few more wheels than to injure the "chip maker."

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 30, 1940

SUMMARY

Cigarette paper .....20 cs.
Wall paper .....1 cs.
Newsprint .....7,164 rolls
Cardboard .....313 cs.
Miscellaneous Paper .....10 cs.

CIGARETTE PAPER

——, ——, Lisbon, 20 cs.

WALL PAPER

Nippon Kogei, ——, Yokohama, 1cs.

NEWSPRINT

——, ——, Comeau Bay, 7,164 rolls.

CARDBOARD

The Rapid Electrotype Co., ——, Lisbon, 313 cs.

MISCELLANEOUS PAPER

Ensing Man'fg Co., Inc., ——, Yokohama, 8 cs.
Marr Duplicator Co., ——, Yokohama, 2 cs.

RAGS, BAGGINGS, ETC.

New England Waste Co., ——, Calicut, 200 bls. cotton waste.
Padawer & Co., ——, Calicut, 400 bls. cotton waste.
Pan American Trust Co., ——, Shanghai, 85 bls. cotton waste.
O'Brien Products, Inc., ——, Shanghai, 75 bls. cotton picker waste.
W. Intner & Co., ——, Shanghai, 100 bls. cotton picker waste.
——, ——, Shanghai, 100 bls. cotton waste.
Padawer & Co., ——, Shanghai, 50 bls. cotton waste.
——, ——, Buenos Aires, 12 bls. old rags.
W. Intner & Co., ——, Bombay, 200 bls. cotton waste.
C. Comiter, ——, Bombay, 200 bls. cotton waste.
——, ——, Havana, 46 bls. rags.

OLD ROPE

Guaranty Trust Co., ——, Calcutta, 167 bls. old hemp rope cuttings, 250 bls. old hemp rope.

CASEIN

American Cyanamid & Chemical Corp., ——, Buenos Aires, 417 bags.
Casein Co. of America, Inc., ——, Buenos Aires, 850 bags.
A. Hurst & Co., ——, Buenos Aires, 250 bags, 15,000 kilos.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 30, 1940

——, ——, Sheet Harbor, 2,547 bls. wet woodpulp.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 30, 1940

Tradesmans National Bank Trust Co., ——, Shanghai, 100 bls. cotton waste.
American Cyanamid & Chemical Corp., ——, Buenos Aires, 500 bags casein, 30,000 kilos.

LOS ANGELES IMPORTS

WEEK ENDING NOVEMBER 30, 1940

——, ——, Tokio, 1 cs. writing paper.
——, ——, Powell River, 1,809 pkgs. newsprint paper, 230 pkgs. paperstock, 223 bls. unbleached sulphite pulp, 43 tons.
——, ——, Yokohama, 4 pkgs. hanging paper.
——, ——, Shanghai, 22 tons waste bagging.
——, ——, Kobe, 1 cs. writing paper, 3 cs. rice paper.

Correction

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Dec. 4, 1940—In the Government printing paper bid opening story appearing in last week's PAPER TRADE JOURNAL, prices were given for the Enterprise Paper Company for Classes 254, 255, 256, 257, 258 and 259.

Due to the fact that the Enterprise Paper Company bid on these items per 1000 sheets instead of per pound as required by the schedule, the Enterprise price seemed to be entirely out of line with the other prices quoted. The prices in the Classes mentioned above for this firm were per 1000 sheets and not per pound.

COMMITTEE MAKES AWARDS

(Continued from page 9)

No. 326, R. P. Andrews Paper Company, 4.69 cents (1,500,000 lbs.); Barton, Duer & Koch Paper Company, 4.71 cents (1,500,000 lbs.); Whitaker Paper Co., 4.83 cents(overrun)

No. 351, Barton, Duer & Koch Paper Company, $6.50 per C sheets.

No. 352, Resolute Paper Products Corporation, $18.48 cents per C sheets.

No. 360, Bartgis Brothers Company, 2.125 cents.

No. 361, Whitaker Paper Company, 1.66 cents.

No. 362, Mathers-Lamm Paper Company, 4.80 cents.

No. 363, George W. Millar & Co., Inc., 3.75 cents.

No. 364, Barton, Duer & Koch Paper Company, 2.20 cents.

No. 365, Barton, Duer & Koch Paper Company, 2.14 cents.

No. 366, Mathers-Lamm Paper Company, 3.5825 cents.

No. 367, Mathers-Lamm Paper Company, 3.5825 cents.

No. 368, Consolidated Paper Company, 5.05 cents (carlots) and same firm, 5.15 cents (less than carloads).

New York Paper and Pulp Market Review

Paper Market Continues To Reflect Seasonal Lull As Christmas and Inventor Periods Near — Pulp Market Quiet With Prospect That Prices Will Remain Unchanged For First 1941 Quarter.

Office of the PAPER TRADE JOURNAL,
Wednesday, December 4, 1940.

Wholesale trade in many grades of paper continues to be maintained at a moderate level, according to reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week. Demand is running under the sales volume at this date last year, when wholesale trade was also levelling off from the peak reached during November. A comparison of prices on many grades of paper last year and today reveals the small advances made and sustained this year in paper prices in comparison with the prices of standard grades of wood pulp.

The index of general business activity for the week ended November 23 advanced to 117.0 per cent, the highest point in its history, from 114.8 per cent for the preceding week, compared with 105.9 per cent for the corresponding period in 1939, and the previous high point of 114.8 for the week ended June 29, 1939.

Paper production of 245 mills for the week ended November 23 was estimated at 87.4 per cent, compared with 96.2 per cent for 1939, with 74.4 per cent for 1938, with 58.0 per cent for 1937, and with 87.9 per cent for the corresponding week for 1936.

Paper board production for the week ended November 23 was 77.0 per cent, compared with 78.0 per cent for 1939, with 57.0 per cent for 1938, with 50.0 per cent for 1937, and with 75.0 per cent for the corresponding week for 1936.

Reports on activity in the wholesale paper market at this date reflect about the usual situation, with the normal tapering off before Christmas and the annual inventory period. While sales of most grades of white paper are now levelling off, wrapping papers, including kraft, kraft liner board and some grades of paper board are moderately active.

The price situation is relatively unchanged on all grades of paper, with some grades of paper board soft and indications of possible lower prices in the near future. A somewhat curious relationship between pulp and paper prices is that existing between kraft liner board, at $55 per ton, while some brands of kraft pulp are reported being sold at $55 per ton.

Mechanical Pulp

The mechanical pulp market is seasonally quiet with no change in prices expected in the trade for the first 1941 quarter. Current reports indicate this market is rather weak but otherwise unchanged at this date.

Chemical Pulp

No change in chemical pulp contract prices for the first 1941 quarter is expected in the trade. Rayonier announced last week that its prices on paper and rayon pulps would be continued unchanged for the quarter ended March 31, 1941.

A late report from three Canadian pulp producers announces no change from prevailing contract prices on bleached and unbleached sulphite for the first three months of 1941 and this is viewed as indicating pulp and paper prices will probably remain unchanged for the first quarter of 1941.

Rags

The domestic rag market continues moderately active with prices holding firm. No important change in the market situation or in prices has been reported this week.

Old Rope and Bagging

Old Manila rope prices continue very firm under the influence of sharply limited supplies. No change from prevailing quotations has been reported to date.

Mill buyers of old bagging continue to show interest in the market, as supplies are reported limited. Prices are firm and no changes have been reported this week.

Old Waste Paper

An increase in supplies of folded news, corrugated, and No. 1 mixed paper, has resulted in lower prices on these grades this week. Strictly folded news is currently quoted at from .52½ to .57½; corrugated at from .47½ to .52½; and No. 1 mixed paper, at from .27½ to .32½.

Twine

Demand for many grades of twine continues to reflect the usual seasonal tapering off in demand before the Christmas holiday. Prices, on the whole, are firm, with no important changes reported during the current week.

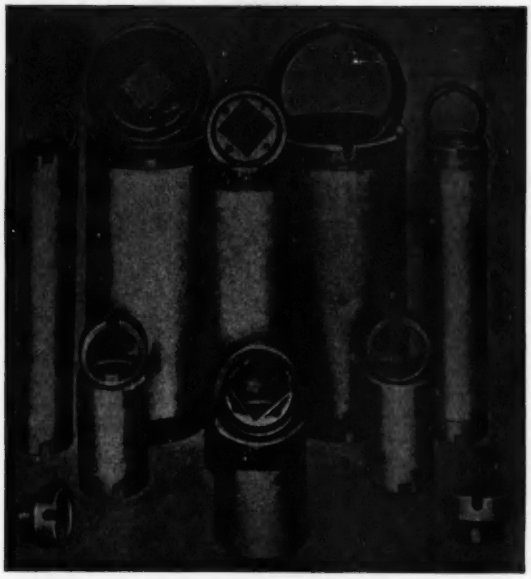
Malcolm Black Goes with Union Bag

Alexander Calder, president of Union Bag and Paper Corporation, announced on Monday of this week the appointment of Malcolm Black as personnel manager. The post, which is one newly created by the company, will involve both employe and public relations.

Mr. Black for the past ten years has been an officer and director of Bliss, Fabyan & Co. Previously he had served as vice president and director of Butterick Publishing Company.

Sherman Shows New Line

A new line of Duo-Tone corrugated pan liners and trays was presented by the Sherman Paper Products Corporation of Newton Upper Falls, Mass. in its exhibit at the New England Baker's Convention in Boston. The new line included many two-color combinations for use in both baking and packaging. In addition, the Sherman exhibit featured its complete line of paper products for the baking trade. The exhibit was under the direction of Carroll Dearing.



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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, December 4, 1940.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Demand reported moderate for the week. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm with demand reported moderate for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums at works.

CASEIN—Quotations on casein are reported firm. Demand moderate for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 13 cents per pound; 80-100 mesh, at 13½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 12 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are firm and unchanged. Shipments continue in moderate volume. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—The demand for chlorine is reported good. Prices are firm and continue unchanged for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm with prices lower for the week, "G" gum rosin is currently quoted at $1.83 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.87 per 100 pounds, in barrels, New York. Seventy per cent gum rosin is quoted at $2.53 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm under a good demand with current quotations continuing nominal. Domestic salt cake is currently quoted at $17 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $20 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Shipments reported steady. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are reported firm and continue unchanged at prevailing market quotations. Pearl is currently quoted at $2.90 per 100 pounds; powdered starch at $3 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported good for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. l. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	57.00
White Pat. Coated	67.00	"	70.00
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items.

Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1.	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	" 36.50	32.20	" 37.75
85% Rag	....	"	29.90	" 35.00
75% Rag	23.60	" 27.75	24.75	" 29.00
65% Rag	....	"	21.65	" 26.25
50% Rag	17.55	" 21.50	18.70	" 22.75
25% Rag	14.65	" 17.75	15.80	" 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items.

Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$9.35	@ $11.50	$11.55	@ $12.75
No. 2	8.50	" 10.25	9.65	" 11.75
No. 3	8.05	" 9.25	9.20	" 11.25
No. 4	7.70	" 9.50	8.90	" 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	$10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	No prices		
Dry	No prices		
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
News Grade, delivered Unbleached Sulphite	58.00	"	61.50
(On Dock, Atlantic Ports)			
Kraft Bleached	4.12½	"	
Kraft Light & Strong	3.50	"	3.75
Kraft No. 1	3.40	"	3.60
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	2.75	"	3.37½
(Delivered)			
Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.

Shirt Cuttings—			
New White, No. 1.	6.50	@	6.75
Silesias No. 1	4.50	"	4.65
New Unbleached	6.25	"	6.50
Blue Overall	4.35	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.10
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.50	"	3.65
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.70
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.50	"	1.65
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.00	"	1.10
No. 2	1.00	"	1.05
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

West Virginia Pulp and Paper Company

230 Park Ave.
New York

35 East Wacker Drive
Chicago

Public Ledger Building
Philadelphia, Pa.

503 Market St.
San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.

Woolen manufacturers since 1856

THIS FREE SAMPLE

IS OUR STAR SALESMAN

We are proud of the fact that *more than 90% of the engineers who request working samples of Greene, Tweed Packings become permanent users.* Such remarkable approval by these engineers who have tested our packings under every conceivable condition should convince you that you cannot afford to delay in making your own tests. If you want longer packing life, less wear and less frequent shut-downs for repacking, send right now for your free working sample specifying size and service.

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If you have not already tested a Greene, Tweed Packing against the best other packing you know of, do so at once. It will save you money in longer packing life, less moving parts wear and reduced service interruption for replacement. Send for your sample today specifying size and service.

GREENE, TWEED & CO.
SELF-LUBRICATING & SHEET PACKINGS
101 Park Ave., New York, N. Y.
Established 1863

CUTNO
Reg. U. S. Pat. Off.
PACKING

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o .b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	2.50	"	2.75
Wool Tares, light...	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads.....	2.62½	"	2.75
Sisal Strings.....	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	"	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book...	.80	"	.85
Crumbled No ...	.70	"	.75
Ledger White Stock.	1.70	"	1.75
Ledger Stock Colored	1.30	"	1.40
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.40	"	1.50
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue	.70	"	.75
Strictly Folded....	.52½	"	.57½
Corrugated	.47½	"	.52½
No. 1 Mixed Paper..	.27½	"	.32½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18	@	—
White Hemp.....	.18	"	—
Fine Polished—			
Fine India.....	.22	"	—
Unpolished—			
Box	.16	"	—
Paper Makers.....	.13	"	—
Tube Rope.....	.14¾	"	—
Wall Paper.....	.16	"	—
Wrapping	.16	"	—
Soft Fiber Rope....	.14	"	—
Cotton	.24	"	—
(Hard Fiber)			
Medium Java.....	.10	"	—
Mex. Sisal.....	.09½	"	—
Manila	.23	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1.	.06½	@	.07
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1.....	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached...	.06	"	.06¼
Washable Prints...	.02¾	"	.02½
Washable, No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01½
Fancy Percales....	—	"	.03
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03¾
No. 2 Mixed.....	.01¾	"	.02
Corduroy	.01¼	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....Nominal			
Domestic No. 1...	1.10	"	1.15
Domestic No. 2...	.95	"	1.00
Roofing Bagging..	.85	"	.90

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.25	@	2.50
Manila Rope.....	—	"	5.00
Sisal Rope.....	2.00	"	2.25
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.25	"	2.50
No. 2.....	—	"	1.50
Wool Tares, heavy..	3.75	"	4.00
New Light Burlap	3.00	"	4.00
New Burlap Cuttings	2.25	"	2.50

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard White	2.40	@	2.50
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White	2.00	"	2.10
No. 2 Soft White	1.60	"	1.75
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.65	"	1.70
Ledger Stock, colored	1.20	"	1.25
No. 1 Books, heavy..	.80	"	.85
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.50	"	.55
Container Manila....	.45	"	.50
Kraft Paper.....	1.30	"	1.35
No. 1 Mixed Paper..	.30	"	.35
Straw Board Chip...	.30	"	.35
Binders Board Chip..	.30	"	.35
Corrugated Board...	.60	"	.65
Overissue News.....	.70	"	.75
Old Newspapers.....	.50	"	.55

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.00
No. 1 Soft White	2.00	"	2.25
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers.....	1.50	"	1.75
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock.....	.75	"	.85
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings extra quality	2.35	"	2.60
White Blank News..	1.40	@	1.50
No. 1 Kraft.....	1.25	"	1.30
Extra No. 1 Kraft...	1.00	"	1.65
Mixed Papers.....			
Print Manila.....	.55	"	.60
Container Manila..			
Old Newspapers....	.50	"	.55
Paper Wool Strings.	.95	"	1.10
Overissue News.....	1.00	"	1.10
Box Board Chips....	.40	"	.45
Corrugated Boxes...	.55	"	.60
Kraft corrugated boxes	.90	"	1.00
New Kraft Corrugated Cuttings	1.45	"	1.60
Screening Wrappers.	.70	"	.80

Bagging

(f.o.b. Boston)

Gunny Bagging—			
Foreign	2.70	"	—
Domestic	2.25	"	2.40
Sisal Rope.....	2.25	"	2.50
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	—	"	2.40
Domestic	2.00	"	2.25
Soft Jute Rope.....	3.25	"	3.50
Manila Rope—			
Foreign	5.00	"	5.25
Domestic	4.75	"	5.00
Jute Carpet Threads	2.00	"	2.25
Bleachery Burlap....	4.00	"	4.25
Scrap Burlap—			
Foreign	2.35	"	2.50
Domestic	2.15	"	2.35
Scrap Sisal.....	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares—			
Foreign, Heavy...	2.40	"	2.50
Domestic	2.40	"	2.50
Aust. Wool Pouches.	2.75	"	3.00
New Burlap Cuttings	3.75	"	4.00
Heavy baling bagging	2.75	"	3.00
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales .	.04	"	.04¼
New White No. 1.	.06¾	"	.07
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	—	"	.06½
Underwear Cutters, Bleached	—	"	.06½
Silesias No. 1	.05	"	
New Black Silesias..	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached...	.07	"	.07½
Blue Cheviots.....	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04¾	"	.05
New Black, Soft..	.03	"	.03¼
Khaki Cuttings....	.02½	"	.03
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.02½	"	.03
New Canvas.....	.06¾	"	.07
B. V. D. Cuttings...	.07	"	.07¼

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	2.75	"	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.00	"	2.25
Old Blue Overalls ..	1.60	"	
Thirds and Blues—	1.50	"	1.75
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.30
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias	(nominal)		

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings....	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.10
Blanks	1.50	"	1.60
Krafts	1.40	"	1.50
New Kraft Cuts.....	1.60	"	1.75
Overissue News.....	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Rooing Stocks—			
No. 1.....	.95	@	1.00
No. 2.....	.85	"	.90

Thanks for the Forests

Counting our blessings is a good way to renew Thanksgiving Day. In these troublous times it reaches out beyond the home and the family and personal conditions. Tyranny elsewhere makes our freedom more deeply appreciated, says Dean Samuel N. Spring of the New York State College of Forestry.

Being a forester, my mind turns naturally toward appreciation of our forest resources and a sense of gratefulness to those who, during the last fifty years, worked so hard to assure productive forests.

"Thanks for the forests" is not an empty phrase. We used our original forests to build quickly a great civilization. We are now working to up-build our great forest resources that they may forever continue to benefit our nation.

There isn't anything to my mind more interesting than to watch planted forests grow and to see the development of woodland trees which have been given added light and growing space by means of proper thinning. I visited a forest in Switzerland that had been managed wisely for four hundred years. Its annual yield solved the tax problem for the citizens of the community.

We need an attitude toward our woodlands such as an old-world owner of 8,000 acres of forest land expressed: "I have two basic objectives in life; one is to hand on to future generations as a steward from my forbears, unimpaired, that which I have received; the other, to fulfill my social obligations to them upon my estate by providing constant employment and equitable living."

I have lived during most of the period when forestry was being developed in this country and there are men still living who were pioneers in this work.